

## LABIATAE IN NICARAGUA

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To report the specimens collected in Nicaragua by my associates and myself is the primary purpose of this article. At the same time, collections by other botanists are listed, so far as they have come to my knowledge, in order to give a fuller account of Nicaragua.

The keys here presented, like those in similar articles by the same author, listed at the conclusion, are the products of his own efforts in identifying specimens from Nicaragua. In the Labiatae, corollas and stamens are fundamental for classification. However, in the fruiting stage, those parts may not be present, or even if present, they may be so small or shriveled that it is difficult to observe their characters. This is likely to be true especially in pressed specimens. Although the following keys are intended for use when flowering characters are not present, they may be used also for flowering specimens. Consequently a few flowering characters are provided. At the same time, some taxonomic treatment which gives fuller descriptions is needed. Entered in the annotated lists of species are a few descriptive notes.

Some of the genera and species included are not yet known in Nicaragua, but are known in some other country in Central America. Who can predict which of them will at some time be found in Nicaragua? For this reason, all those known in Central America are here treated.

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liography at the end of this article or cited in connection with a particular genus.

Brief description of the Labiatae, the Mint Family. Herbs or shrubs or, very rarely, trees, often with 4-sided stems. Leaves opposite or more than 2 at a node, simple, entire or toothed or narrowly lobed; without stipules. Inflorescences various, axillary or terminal; flowers commonly in clusters (verticels). Calyx united at base, 5-toothed or 2-lipped or 8-10-toothed, persistent. Corolla regular or irregular, 4-5-toothed or 2-lipped, united at base. Stamens 2-4, with rudiment often present. Pistil 1; stigma 2-lobed. Ovary and fruit superior, 4-lobed, forming 4, 1-seeded nutlets.

ARTIFICIAL KEY TO GENERA OF LABIATAE  
known to occur in Central America.

- A. Plant rarely blossoming; stem sparsely branched, sparsely hairy or almost glabrous; stolons leafy; blades glandular-dotted beneath, 3-5 cm long, toothed 1 6. Mentha citrata Ehrh.
- A. Plant blossoming or fruiting B.
- B. Calyx-teeth 8 or 10, spine-tipped C.
- C. Calyx-teeth 10 (in ours), almost equal, hooked at tip, throat densely white; flowers sessile or nearly so p. 7  
 . . . . . 4. Horehound, Marrubium vulgare L.
- C. Calyx-teeth 8, unequal, not hooked at tip, throat not white; pedicels 1-2 mm long, p. 7 . . . . .  
 . . . . . 6. Leonotis nepetaefolia (L.) R. Br.
- B. Calyx-teeth not more than 5; calyx variously toothed or lobed D.
- D. Calyx 2-lipped or teeth unequal E.
- E. Inflorescences in axils of leaves, sometimes also terminal; flowers in clusters, racemes or spikes F.
- F. Calyx hairy in throat, 10-13-nerved, all 5 lobes slender, hairy G.
- G. Plant dwarf, matted; blades 5-9 mm long, entire, glandular-punctate; stamens 4, p. 28 . . . . .  
 . . . . . 14. Thyme, Thymus vulgaris L.
- G. Plant not dwarf, not matted; blades 7-20 cm long, dentate, not punctate; fertile stamens 2, p. 26. . . . .  
 . . . . . 11. Hedeoma costatum Hemsley
- F. Calyx glabrous in throat; fertile stamens 2 H.
- H. Leaves linear, entire, revolute; plant a shrub, . . . . .  
 p. 5 . . . . . 2. Rosmarinus officinalis L.
- H. Leaves usually toothed, usually not revolute;  
 plant an herb or shrub, some species of 9. Salvia

- E. Inflorescences (in ours) terminal on main branch or side-branches, not in axils of leaves I.
- I. Flowers in dense heads, a pair of leaves at base of head; lower lip of calyx with 2 lanceolate sharp teeth; upper lip wide, very shallowly toothed, p. 7 . . . . .5. Heal-all, Prunella vulgaris L.
- I. Flowers in slender spike or raceme or panicle J.
- J. Flowers erect or ascending, only in age sometimes reflexed; calyx 2-lipped K.
- K. Calyx-lips entire, closed after flowering; pedicels 2-6 mm long; stamens 4, p. 5 3. Scutellaria
- K. Calyx lips, 1 or both toothed; flowers sessile or on short pedicels; calyx open after flowering; stamens 2, p. 10. . . . some species of 9. Salvia
- J. Flowers not erect, not ascending; stamens 4 L.
- L. Margins of upper lip of calyx decurrent on tube; upper lip entire, lower lip 4-toothed; corolla-tube straight; calyx not gland-dotted, p. 40. . . . . 20. Basil, Ocimum
- L. Margins of upper lip of calyx not decurrent on tube M.
- M. Upper lip of calyx entire, lower lip 4-toothed; flowers sessile, on long leafless peduncle, p. p. 41. . . . . 21. Catopheria
- M. Upper lip of calyx 3-toothed, lower lip 2-toothed; corolla-tube curved; calyx gland-dotted; pedicels 1.5-2.5 mm long; flowers turned sidewise or downward, p. 39. . . 19. Coleus
- D. Calyx not 2-lipped or only slightly so; calyx-teeth equal or nearly so N.
- N. Blades deeply lobed; flower-clusters dense, axillary; calyx-teeth spine-tipped, p. 8 . . 7. Leonurus sibiricus L.
- N. Blades toothed or entire, not lobed O.
- O. Inflorescence spreading almost horizontally; flowers in short axillary racemes; calyx-lobes widely spreading, not tubular; stamens 4; plant a shrub. p. 27. . . . . 13. Chaenostoma mecisandrum Donn. Sm.
- O. Inflorescence erect or ascending; calyx usually tubular R.
- P. Calyx 13-15-nerved; flowers on pedicels Q.
- Q. Calyx hairy, white-hairy in throat; flowers mostly above uppermost leaves; fertile stamens 2 . . p. 28. . . . . 15. Cunila polyantha Bth.
- Q. Calyx glabrous, pilose or glabrous in throat; flowers solitary in axils of full-sized leaves; stamens 4, p. 27. . . . . 12. Satureja

- P. Calyx 10-nerved; flowers often sessile; stamens 4 R.  
 R. Calyx in fruit 10-12 mm long; pedicels 2-3 mm long;  
 flower-clusters distant; calyx-teeth spine-tipped, p.25  
 . . . . . 10. Lepechinia  
 R. Calyx in fruit 1.5-8 mm long S.  
 S. Calyx widened (inflated) in fruit, teeth triangular or  
 ovate; flowers terminal on main stem or branches,  
 lower ones sometimes axillary; calyx 2.5-7 mm  
 long, not gland-dotted, lobes unequal, p.4 . . . . .  
 . . . . . 1. Teucrium  
 S. Calyx not widened in fruit, not inflated, lobes nearly  
 equal. See combined key to Hyptis, Lepechinia,  
Marsypianthes, Mentha and Stachys, p. 29.

## 1. TEUCRIUM Linnaeus

Herbs, ours. Leaves, in ours, toothed. Flowers usually 2  
 in a cluster, axillary or terminal, in heads, racemes or spikes.  
 Calyx 5-toothed, 10-nerved, puberulent, sometimes also pilose,  
 teeth equal or unequal. Corolla slightly 2-lipped. Stamens 4,  
 in pairs, anther-cells divergent. Nutlets obovoid, rugose.

A. Stem distinctly 4-angled, almost winged, sparsely hairy; ca-  
 lyx puberulent, not pilose, tubular, 2.5-5 mm long; corolla  
 5-10 mm long . . . . . 1. Teucrium proctori L. Wms.

A. Stem bluntly angled, densely pilose with spreading curved  
 hairs; calyx puberulent and with long spreading hairs, cam-  
 panulate, 5-7 mm long; corolla purple, 9-11 mm long . . . . .  
 . . . . . 2. Teucrium vesicarium Mill.

1. Teucrium proctori L. Wms., Fieldiana, Bot. 34:114. 1972.  
 Guatemala. Type: Nebay, Proctor 25498.

2. Teucrium vesicarium Miller, Gard. Dict. ed. 8, no. 17. 1768.  
 Illustr., Fl. Panama 56:107. 1969; Fl. Guatemala 9:315. 1973.

Teucrium inflatum Sw., Prodr. Veg. Ind. Occ. 88. 1788.  
 S. Mexico, British Honduras, Guatemala, Honduras, Nicar-  
 agua, Costa Rica, Panama, W. I., Jamaica (FLAS), S. A.

## 2. ROSMARINUS Linnaeus Rosemary

Evergreen shrub. Leaves narrow, entire. Flowers almost  
 sessile in axillary racemes. Calyx 2-lipped, upper 3-toothed,  
 lower 2-toothed. Corolla 2-lipped, upper notched or 2-cleft, low-  
 er 3-lobed. Perfect stamens 2. Nutlets almost globose, smooth.

1. Rosmarinus officinalis L., Sp. Pl. 23. 1753.

Leaves linear, margins revolute, obtuse, tomentose beneath.

Corolla 10-12 mm long. Florida (FLAS), Europe (FLAS).

3. SCUTELLARIA Linnaeus

Skullcap

Herbs (ours) or shrubs. Leaves entire or dentate. Inflorescence a spike or raceme or rarely a panicle, or in axils of leaves. Calyx cup-shaped, 2-lipped; dorsal lip with rounded appendage; lips entire, closed after flowering. Corolla long-tubular, 2-lipped. Stamens 4. Nutlets usually tuberculate or hispid.

A. Petioles 1-5 mm long; blades 1-5 cm long B.

B. Stem glabrous; blades hastate-cordate at base; calyx 2 mm long; corolla blue or purple, 3-4 mm long . . . . . 1. Scutellaria racemosa Pers.

B. Stem hairy; blades not hastate; calyx 3-5 mm long; blades obtuse or almost obtuse at tip C.

C. Stem hirsute; blades 2-3 cm long, almost orbicular, obtuse; corolla 2.5-3 cm long . . . . . 2. Scutellaria lundellii Epling

C. Stem finely hairy or hairy only on angles; calyx 3-4 mm long; corolla 1.5-2.5 cm long D.

D. Stem densely finely velutinous; corolla yellow; pedicels 3-6 mm long . 3. Scutellaria lutea Donn. Sm.

D. Stem sparsely hairy on angles only; hairs curved upward; corolla violet . . . . . 4. Scutellaria dumetorum Schlecht.

A. Petioles 5-30(-40) mm long E.

E. Blades coarsely serrate or crenate-dentate F.

F. Blades gray-hairy above and beneath; calyx 1.5-4 mm long; corolla purple, 13-14 mm long . . . . . 5. Scutellaria guatemalensis Leonard

F. Blades glandular-hairy on nerves beneath, otherwise glabrous; stem and calyx glandular-hairy; crolla crimson, 4-5 cm long . . .8. Scutellaria argentata Leonard

E. Blades sinuate-dentate or almost entire G.

G. Blades rounded or obtuse or acute at tip; corolla 10-15 mm long H.

H. Calyx sparsely hairy; petioles 10-20 mm long; stem densely hairy; hairs recurved . . . . . 7. Scutellaria purpurascens Sw.

H. Calyx densely hairy; petioles 5-12 mm long; stem finely hairy . . .6. Scutellaria seleriana Loesener

G. Blades acuminate or rarely acute at tip I.

I. Stem puberulent at least in upper part. commonly 1m tall; calyx puberulent; corolla red J

- J. Blades almost cordate at base, 8-12 mm long; petioles 1.7-3.5 cm long; corolla 4-5 cm long, glabrous or nearly so . . . . 9. Scutellaria costaricana Wendland
- J. Blades cuneate at base, 4-10 cm long; petioles 1-4 cm long; corolla 2.4-4 cm long, puberulent . . . . .
- . . . . . 10. Scutellaria longifolia Bth.
- I. Stem pilose; blades acute to acuminate at tip, rounded to widely cuneate at base K.
- K. Calyx densely pilose; blades 7-12 cm long, densely softly pilose beneath; corolla red, 4 cm long . . . . .
- . . . . . 11. Scutellaria inflata Epling
- K. Calyx puberulent or glabrate; blades 2-8 cm long, puberulent or short-villous especially on nerves beneath; corolla 1.9-2.4 cm long . . 12. Scutellaria orichalcea Donn. Sm.
1. Scutellaria racemosa Pers., Syn. Pl. 2:136. 1807.  
Scutellaria lewisiana Nowicke, Phytologia 18:419. 1969.  
 Illustr., Fl. Panama 56:102. 1969.  
 Alabama (FLAS), central & southern Mexico, Honduras, Panama, S. A.
  2. Scutellaria lundellii Epling, Lilloa 4:267. 1939.  
 British Honduras.
  3. Scutellaria lutea Donn. Sm., Bot. Gaz. 13:76. 1888.  
 Guatemala.
  4. Scutellaria dumetorum Schlechter, Linnaea 7:400. (before Feb.) 1832. Central & southern Mexico, Guatemala, Fl. Guatemala 9:305. 1973.
  5. Scutellaria guatemalensis Leonard, Contr. U. S. Nat. Herb. 22:715. 1927. Scutellaria purpurascens Sw. var. heterophylla Bth. Very similar to Scutellaria seleriana Loesener. Mexico. Guatemala, Fl. Guatemala 9:305. 1973.
  6. Scutellaria seleriana Loesener, Bull. Herb. Boiss. 7:568. 1899. Calyx including teeth 1-2 mm long. S. Mexico, Guatemala, Fl. Guatemala 9:309. 1973.
  7. Scutellaria purpurascens Sw., Prodr. Veg. Ind. Occ. 89. 1788. Guatemala, Costa Rica, Panama, W. I., Colombia, Venezuela (FLAS), Brazil, Fl. Guatemala 9:308. 1973.
  8. Scutellaria argentata Leonard, Journ. Wash. Acad. Sci. 17:170. 1927. Costa Rica.
  9. Scutellaria costaricana Wendland, Hamb. Gart. Zeit. 19:29. 1863. Petioles of longer leaves 1.7-3.5 cm long. Costa Rica.
  10. Scutellaria longifolia Bth. in Lindley Bot. Reg. 18: sub.t. 1493. 1832. Illustr., Fl. Guatemala 9:307. 1973.  
Scutellaria glabra Leonard, Contr. U. S. Nat. Herb. 22:715. 1927. Mexico, Guatemala, Salvador, Costa Rica, Fl. Guatemala 9:306. 1973.

11. Scutellaria inflata Epling, Lilloa 4:270. 1939. May be a synonym of Scutellaria longifolia Bth., Fl. Guatemala 9:306. 1973. British Honduras, Guatemala.
12. Scutellaria orichalcea Donn. Sm., Bot. Gaz. 14:29. 1889. Mexico, British Honduras, Costa Rica, Fl. Guatemala 9:308. 1973.

4. MARRUBIUM Linnaeus Horehound  
Herbs. Leaves dentate, in ours, or lobed. Flowers in axillary clusters. Calyx 5-10-toothed, 5-10-nerved, teeth equal or unequal, often spreading or recurved. Corolla 2-lipped, upper lip entire or slightly 2-lobed, the lower spreading, 3-lobed. Stamens 4, anther-cells divaricate. Nutlets ovoid, smooth.

1. Marrubium vulgare L., Sp. Pl. 583. 1753.  
United States, Florida, Mexico (FLAS).

5. PRUNELLA Linnaeus Heal-all  
Herbs, low (ours) to decumbent or prostrate. Leaves on petioles, entire or toothed or pinnatifid. Flowers in dense terminal or sometimes axillary heads. Bracts wide. Calyx 2-lipped, reticulate-veined. Corolla 2-lipped, upper lip erect, entire, lower lip 3-lobed. Stamens 4. Nutlets flattened, ovoid, smooth. See Rhodora 15:179. 1913.

1. Prunella vulgaris L., Sp. Pl. 600. 1753.  
Plants sprawling, branched at base, branches about 30 cm long. Leaves 3-8 cm long, obtuse or almost acute, rounded to acute at base, entire or slightly toothed. Flowers sessile in dense heads. Calyx upper lip faintly 3-lobed, lower lip 2-toothed. United States, Florida, Mexico, Costa Rica, W. I., Europe (FLAS).

6. LEONOTIS Robert Brown  
Herbs, rarely shrubs. Leaves dentate. Petioles long. Flowers in very dense axillary clusters. Calyx with 8-10 unequal sharp-tipped teeth, 10-nerved. Corolla 2-lipped, tube curved, upper lip erect, lower 3-lobed. Stamens 4; anther-cells divergent. Nutlets 3-angled, smooth.

1. Leonotis nepetifolia R. Br. in Aiton Hort. Kew. ed. 2. 3:409. 1811. Illustr., Fl. Guatemala 9:260. 1973.  
Pedicels 1-2 mm long. Corolla scarlet or orange, 2-2.5 cm long.

Florida, Mexico, W. I. (FLAS).

7. LEONURUS Linnaeus

Herbs. Leaves sharply lobed. Petioles long. Flowers in dense axillary clusters. Calyx with 5 almost equal, sharp-tipped teeth, 5-nerved. Corolla 2-lipped, tube straight, upper lip erect, entire, lower spreading, 5-lobed. Stamens 4; anther-cells usually parallel. Nutlets 3-angled, smooth.

1. Leonurus sibiricus L., Sp. Pl. 587. 1753. Illustr., Flora Guatemala 9:260. 1973. Leaves lobed. Corolla purple-red, 8-12 mm long. Adventive from Eurasia. United States, Florida (FLAS), Cuba (FLAS), Jamaica (FLAS), Europe.

Nicaragua:

Jinotega, Jinotega. Grant 7285 (GH).

Matagalpa, Sebaco. Atwood 2490 (VT); Mena 2514 (GH, MO).

Boaco, Camoapa. Atwood 3472 (VT); Seymour 3491 (NY, UC, WDP).

Teustepe. Atwood 2420a (F, SEYM).

Granada, Mombacho. Grant 765 (GH).

8. STACHYS Linnaeus

Herbs. Leaves on petioles or almost sessile. Flower-clusters in axils of leaves or bracts, or upper ones without leaves or bracts. Blades often cordate at base. Calyx-lobes equal or nearly equal, sometimes spine-tipped, tube 3-7 mm long. Corolla distinctly 2-lipped, upper lip 2-lobed, lower 3-lobed. Stamens 4; anthers divergent or parallel. Nutlets obovate, smooth or roughened.

Stachys is distinguished from Hyptis and Marsypianthes by the stamens ascending under the upper lip of the corolla, whereas in Hyptis and Marsypianthes, the stamens are declined toward the lower lip. In Stachys the corolla is strongly 2-lipped, in Hyptis slightly 2-lipped. From Lepechinia, Stachys differs in having stamens and style exerted from the corolla, whereas in Lepechinia, they are not exerted. In Stachys and Lepechinia, the lower lip of corolla is plane; in Hyptis and Marsypianthes, it is saccate.

A. Blades almost sessile, very obtuse at tip; calyx 4.5-6 mm long, lobes not spine-tipped; corolla 6-9 mm long . . . . .

. . . . . 1. Stachys calcicola Epling

A. Blades on long slender petioles; blades rounded or truncate or heart-shaped at base B.

B. Hairs of stem long, spreading, usually dense; calyx 3-7 mm long C.



- C. Leaves thinly hirsute above and beneath; calyx long-hirsute; corolla purplish, tube 5-7 mm long . . . . .  
 . . . . . 2. Stachys guatemalensis Epling
- C. Leaves thinly to densely pilose above and beneath; stems densely pilose with spreading hairs; calyx pilose D.
- D. Plant annual; flowers in clusters of 6-12; blades 1.5-5 cm long; corolla pink or purple, 2.5-4 cm long . . . . . 3. Stachys agraria C. & S.
- D. Plant annual; flowers in clusters of 6; blades 3-8 cm long; corolla red, tube 18-21 mm long . . . . .  
 . . . . . 4. Stachys coccinea Jacq.
- B. Hairs of stem usually recurved or short-pilose E.
- E. Blades 5-13 cm long, acute or acuminate; calyx 9.5-11.5 mm long; corolla red, 18-23 mm long; plant climbing . . . . . 5. Stachys lindenii Bth.
- E. Blades 2-5 cm long; calyx 4.5-5.5 mm long; plant procumbent or clambering F.
- F. Calyx 6-8 mm long, pilose; corolla-tube 6-8 mm long . . . . . 6. Stachys pittieri Briq.
- F. Calyx 4.5-5.5 mm long G.
- G. Calyx short-hirtellous, 5-5.5 mm long; corolla pink tube 5-6 mm long . . 7. Stachys costaricensis Briq.
- G. Calyx densely softly pilose, 4.5-5 mm long in flower; corolla purple, tube 12-14 mm long . . . . .  
 . . . . . 8. Stachys nubilorum Epling
1. Stachys calcicola Epling, Bull. Torr. Bot. Club 71:484. 1944. Guatemala.
2. Stachys guatemalensis Epling, Rep. Sp. Nov. Beih. 80:34. 1934. Illustr., Fl. Guatemala 9:313. 1973. Mexico, Guatemala, Honduras, Nicaragua, Fl. Guatemala 9:312. 1973. Nicaragua, Chontales, Acoyapa. Marshall & Neill 6531 (SEYM).
3. Stachys agraria C. & S., Linnaea 5:100. 1830. S. United States, Mexico, Guatemala, Honduras, Fl. Guatemala 9:310. 1973. Nicaragua: Nueva Segovia, Plan Grande. Seymour 5147 (SEYM). Best distinguished from Stachys coccinea Jacq. by the corollas.
4. Stachys coccinea Jacq., Pl. Hort. Schoenbr. 3:18, t. 284. 1798. Sw. United States, Mexico, Guatemala, Nicaragua, Fl. Guatemala 9:311. 1973.
5. Stachys lindenii Bth. in DC. Prodr. 12:467. 1848. S. Mexico, Guatemala, Fl. Guatemala 9:312. 1973.

6. Stachys pittieri Briq., Ann. Conserv. Geneve 2:119. 1898.  
Endemic in Costa Rica.
7. Stachys costaricensis Briq., Bull. Soc. Bot. Belg. 30:240.  
1891. Illustr., Fl. Panama 56:110. 1969.  
Costa Rica (FLAS), Panama.
8. Stachys nubilorum Epling, Rep. Sp. Nov. Beih. 80:48. 1934.  
Guatemala. Type: Santa Elena, Skutch 209.  
Closely allied to Stachys coccinea Jacq., which has spreading  
hairs on the stem. In Stachys nubilorum Epling, hairs of  
stem are retrorse.
9. SALVIA Linnaeus

Herba or shrubs. Leaves entire or toothed in Central America, elsewhere in some species incised or pinnatisect. Flowers in dense globose heads or in clusters, on pedicels or sessile, axillary or terminal. Calyx 2-lipped, upper entire or 3-toothed, lower 2-cleft, throat naked, Corolla 2-lipped, upper erect-concave, entire or notched, lower spreading, 3-toothed. Perfect stamens 2. Nutlets ovoid, smooth, 3-angled or compressed.

Salvia is an unusually difficult genus because of much variability of characters in some species. Often leaves and stem may be either hairy or glabrous; and the calyx varies in length more than usual because of its lengthening in fruit. The species in this genus appear to be the product of an extensive series of hybridizations.

Unless otherwise stated, measurements of leaves apply to the largest leaves, not to the much smaller leaves which often occur.

- A. Bracts of inflorescence ovate or wider, usually persistent, sometimes kidney-shaped, usually conspicuous, sometimes obscuring calyces B. cp. p. 12
- B. Calyx red or reddish or bluish or purple, at least 6-20 mm long C. cp. p. 11
- C. Flowers on pedicels; longest pedicels 6-15 mm long or longer; corolla reddish, tube 18-34 mm long; usually a shrub D.
- D. Stem puberulent; calyx hispidulous, without long tail-like tip, about 9 mm long; bracts long-persistent, purplish; corolla purple, about 18 mm long; pedicels up to 6 mm long, p. 24. 33. Salvia guarinae Standley
- D. Stem tomentose to glabrous; calyx villous to puberulent, at least 12-15 mm long; corolla reddish, 19-34 mm long; blades tomentose beneath; usually shrub E.
- E. Stem tomentose throughout; calyx 13-16 mm long after flowering, puberulent or villosulous, with long tail-like tip at flowering time; bracts of in-

- florescence falling very early; corolla reddish, tube 19-25 mm long; pedicels 10-15 mm long, p. 20 . . . . . 5. Salvia karwinskii Benth.
- E. Stem glabrous below, hairy in upper part; calyx red, villous, without tail-like tip, at least 14-15 mm long; bracts of inflorescence red, villous; corolla red to rose, tube 22-34 mm long; pedicels 2-10 mm long, p. 21 . . . . . 6. Salvia wagneriana Polak.
- C. Flowers sessile or nearly so F. cp. p. 10
- F. Calyx scarlet, 15-20 mm long; blades rounded at base; bracts scarlet; corolla scarlet, tube 30-40 mm long; annual, p. 21 . . . . . 12. Salvia splendens R. & S.
- F. Calyx purple or bluish, at least 6-10 mm long; shrub G.
- G. Calyx bluish, at least 6-7 mm long, hispidulous or hirsute, usually viscid; blades usually subtomentose beneath; bracts 1.2-1.6 cm wide; corolla blue, tube 5-6.5 mm long, p. 22 18. Salvia rubiginosa Benth.
- G. Calyx purple, at least 10 mm long, puberulent on nerves; blades glabrous; bracts 1-3 cm long, deciduous; corolla pink to rose, tube 16-17 mm long, p. 22 . . . . . 16. Salvia grandis Epling
- B. Calyx green or whitened, 5-14 mm long H. cp. p. 10
- H. Blades glabrous or nearly so, or thinly scabrous above; bracts entire I.
- I. Calyx 5-7.5 mm long in fruit, narrowed to tail-like tip; tip 2 mm long; calyx with glandular hairs; blades puberulent beneath on nerves, 5-18 cm long; bracts 1-2 cm long, deciduous; corolla red, tube 15-25 mm long; herb cp. p. 19, 21 . . . 10. Salvia cinnabarina Mart. & Gal.
- I. Calyx 11-14 mm long, glabrous, without tail-like tip J.
- J. Blades softly pilose beneath, 7-9 mm long, veins elevated, reticulate; stem with spreading hairs; corolla purple, tube 18-21 mm long; shrub; cp. p. 16, 21 . . . . . 8. Salvia opertiflora Epling
- J. Blades glabrous beneath, 10-15 cm long; stem glabrous; bracts reddish, falling early; corolla scarlet, tube 20-27 mm long; herb or shrub, p. 14, 22 . . . . . 15. Salvia miniata Fern.
- H. Blades hairy above; flowers sessile or on very short pedicels; bracts persistent K.
- K. Bracts of inflorescence finely toothed, 8-10 mm wide; bracts 8-10 mm wide; corolla blue, tube 2-3.5 mm long; herb L.
- L. Calyx sparsely pilose on nerves; bracts sparsely pilose; blades 1.5-3.5 cm long; petioles 1-1.5 cm long; calyx about 8 mm long, p. 22 14. Salvia fracta L. Wms.

- L. Calyx densely villous-hirsute with white hairs or almost glabrous; bracts villous-hirsute, 8-10 mm wide; blades 2-6 cm long; petioles 1.5-2.5 cm long on lower leaves; calyx at least 3.5-4.5 mm long, p. 22 . . . . . 17. Salvia hypnotoides Mart. & Gal.
- K. Bracts of inflorescence not toothed M.
  - M. Calyx in fruit not over 3 mm long, glandular-hairy; blades obtuse or acute, 2-6 cm long; corolla blue, tube 2.5 mm long; stem prostrate at base; herb, p. 19 . . . . . 1. Salvia occidentalis Sw.
  - M. Calyx 5.5-11 mm long in fruit N.
    - N. Bracts heart-shaped at base, acuminate, as wide as long, bluish or reddish, much longer than calyces; blades 4-10 cm long, hairy or almost glabrous above and beneath, attenuate at base; calyx 5.5-7.5 mm long; corolla blue to violet, tube 6-8 mm long, p. 22. . . . . 13. Salvia mocinoi Bth.
    - N. Bracts not heart-shaped at base O.
      - O. Calyx 1-2 mm long after flowering, up to 8 mm long in fruit, glandular hispidulous, teeth with spine-like tips; blades 1.5-3.5 cm long, acute or obtuse; bracts lanceolate, persistent; corolla blue, tube 2.5-3 mm long; herb, procumbent or decumbent, . . . p. 20 . . . . . 2. Salvia misella HBK.
      - O. Calyx 8-11 mm long in fruit; blades 4-12 cm long, acute or acuminate P.
        - P. Calyx densely white-hirsute; blades 5-8 cm long, densely hairy above and beneath; bracts ovate, abruptly narrowed to long awl-like tip; corolla blue, tube 4.5-5.5 mm long; erect annual, p. 21 . . . . . 9. Salvia hispanica L.
        - P. Calyx hairy to glabrous, not whitened; blades soft-hairy above, white-tomentose beneath; bracts as wide as long; corolla purplish, tube 7.5-9 mm long long; shrub, p. 22 19. Salvia shannonii Donn. Sm.
  - A. Bracts of inflorescence narrow or falling early and thus appearing absent, lanceolate to setaceous, never rounded or kidney-shaped, inconspicuous, not obscuring calyx; cp. p. 10
  - Q. Calyx made white or yellowish or purplish by hairs R.
    - cp. p. 13
    - R. Calyx densely white-hirsute, at least 12 mm long in fruit; stem white-hirsute; blades obtuse to rounded at tip, white-tomentose beneath, rounded to almost heart-shaped at base; corolla rose-purple, tube 12 mm long; herb, p. 22. . . . . 20. Salvia leucochlamys Epling
    - R. Calyx variously hairy but not hirsute S.

S. Calyx stellate-tomentose with yellowish or purplish hairs, 10-15 mm long after flowering; blades truncate to rounded at base, 3-7(-13) cm long; corolla red, tube 8-10 mm long; shrub, p. 22 .21. Salvia lasiantha Bth.

S. Calyx without stellate hairs T.

T. Blades rounded at base, acuminate at tip, 6-12 cm long; calyx whitish-hirtellous or woolly, at least 4-9 mm long; pedicels 2-4 mm long; corolla purple, tube 10-18 mm long; herb, p.23 25. Salvia purpurea Cav.

T. Blades acute to attenuate at base, 3-9 cm long U.

U. Calyx 13 mm long, woolly; pedicels 4 mm long; corolla red, tube included in calyx; tending to be shrubby; blades 8 cm long, p. 22 . . . . . 22. Salvia pittieri Briq.

U. Calyx 4-8 mm long; flowers sessile or nearly so; blades 3-9 cm long; corolla blue; Herb V.

V. Stem leafless on upper part; leaves all near base; calyx densely white-tomentose, at least 5-8 mm long, teeth short, obtuse; pedicels 1-2(-3) mm long; corolla-tube 6-9 mm long, p. 23 . . . . . 27. Salvia farinacea Bth.

V. Stem leafy above base; calyx often whitish-striose to nearly glabrous, 4-5.5(-7) mm long, lobes narrowly triangular, short-attenuate; flowers sessile or nearly so; corolla-tube 3.5-4.5 mm long; petioles of larger leaves 1-5(-10) mm long, p. 23 . . . . . 23. Salvia lavanduloides HBK.

Q. Calyx not made white or yellowish or purplish by hairs W. cp. p. 12

W. Stem leafless on upper part; leaves all near base; blades 4-9 cm long; calyx 5-8 mm long, glandular-hispidulous or hirtellous, with black glands; flowers sessile; blades glabrous above; corolla violet, tube 5-6 mm long; herb, p. 23 . . . . . 28. Salvia nana HBK.

W. Stem leafy above base; flowers sessile or on pedicels X.

X. Flowers sessile Y. cp. p. 14

Y. Blades glabrous beneath or nearly so; corolla scarlet Z.

Z. Calyx scarlet, inflated, in flower 20 mm long; larger blades 6-9 cm long, 4-5.5 cm wide, rounded at base; corolla-tube 30-40 mm long, p. 21 . . . . . 12. Salvia splendens R. & S.

- Z. Calyx green, not inflated, 11-14 mm long; blades 10-15 cm long, 3-6 cm wide, acute or attenuate at base; corolla-tube 20-27 mm long; p. 22 . . . . . 15. Salvia miniata Fern.
- Y. Blades hairy beneath at least at base or on nerves Aa.
- Aa. Calyx glandular-hispidulous, 1-2(-8) mm long, teeth with spine-like tips, p. 20 2. Salvia misella HBK.
- Aa. Calyx not glandular-hispidulous Ab.
- Ab. Calyx villous, 2.5-5 mm long; pedicels 0.5-2 mm long; petioles of larger leaves 2-4 cm long, p. 23 . . . . . 26. Salvia polystachya Ortega
- Ab. Calyx not villous Ac.
- Ac. Calyx 4-5.5(-7) mm long, nearly glabrous or hairs appressed; petioles 1-5(-10) mm long, p. 23 . . . . . 23. Salvia lavanduloides HBK.
- Ac. Calyx at least 8 mm long, glabrous or nearly so; petioles 1-5 cm long, p. 23 . . . . . 32. Salvia kellermanii Donn. Sm.
- X. Flowers on pedicels; pedicels 1-10 mm long, usually 5-7 mm long Ad. cp. p. 13
- Ad. Blades linear, 2-8 cm long, 1.5-5 mm wide, entire or nearly so; calyx 2-3 mm long; corolla blue, tube 7-10 mm long; herb, p. 24 . . . . . 34. Salvia leptophylla Benth.
- Ad. Blades wider, lanceolate to ovate; pedicels 1-8 mm long Ae.
- Ae. Blades glabrous or nearly so beneath when mature Af. cp. p. 16
- Af. Blades hairy above, sometimes dotted beneath, sometimes sparsely scabrous Ag. cp. p. 15
- Ag. Blades sagittate-cordate at base; calyx glandular-villous, 5 mm long; corolla blue, about 10 mm long; herb, p. 24 35. Salvia costaricensis Oersted
- Ag. Blades not sagittate Ah.
- Ah. Calyx glabrous, 8 mm long; corolla white, tube about twice as long as calyx; blades attenuate to base; pedicels sometimes 8 mm long; tending to be shrubby, p. 24 . . . . . 36. Salvia drymocharis Epling
- Ah. Calyx hairy at least on nerves Ai.
- Ai. Calyx 4-8 mm long, green, hairy on nerves only; pedicels 1-3 mm long; blades 4-6 cm long, sparsely hairy on both surfaces or almost glabrous; corolla blue or white, 4-10 mm long, p. 24 37. Salvia tiliaefolia Vahl
- Ai. Calyx 9-18 mm long in fruit, purplish; corolla purplish; blades 7-15 cm long; racemes interrupted; pedicels 4-13 mm long Aj.

- Aj. Blades rounded or heart-shaped at base, glabrous beneath, dotted beneath with minute yellowish glands, above with short harsh hairs; calyx 9-11 mm long at flowering time, sparsely villous; corolla-tube 20-25 mm long; herb, p. 25 44. Salvia recurva Bth.
- Aj. Blades cuneate-attenuate at base, glabrous or nearly so; calyx in fruit 17 mm long, densely short-puberulent; corolla 4 cm long; shrub, p. 25. . . . . 42. Salvia bella Briq.
- Af. Blades glabrous above and beneath Ak. cp. p. 14
- Ak. Calyx glandular-hairy Al.
- Al. Blades acute or acuminate; axis of inflorescence glandular-hairy; blades shallowly or deeply heart-shaped at base, 5-10 cm long; pedicels 2-6 mm long; corolla red, tube 20-23 mm long, p. 20 . . .4. Salvia holwayi Blake
- Al. Blades obtuse or rounded at tip; axis of inflorescence not glandular-hairy; blades truncate at base, 1.5-4.5 cm long; longest petioles 1.2-1.8 cm long; calyx at least 3.5-5.5 mm long, in fruit 6-8 mm long; pedicels 1-3 mm long; corolla usually blue, tube 4-6 mm long, p. 21 . . . . . 11. Salvia micrantha Vahl
- Ak. Calyx not glandular Am.
- Am. Calyx blue or violet or purple or reddish, at least 9-14 mm long, 9-18 mm long in fruit; blades glabrous or slightly hairy on veins beneath An.
- An. Racemes 5-10 cm long; plant almost glabrous throughout; petioles 5 mm long; blades 10-20 cm long; calyx at least 10 mm long, dark-purple, hispidulous on nerves only; corolla deep-purple, tube 15-17 mm long, p. 25 . . . . . 41. Salvia pansamalensis Donn. Sm.
- An. Racemes 20-40 cm long; stem hispidulous; petioles 2-6 cm long; blades 6-12 cm long; calyx at least 12-14 mm long, reddish, hispidulous; corolla red, tube 24 mm long; pedicels 6-7 mm long, p. 25 . . . . . 45. Salvia subrubens Epling
- Am. Calyx green, 5.5-8 mm long; pedicels 1-4mm long Ao.
- Ao. Blades 2-3.5 cm long, 2 cm wide; petioles 1-4 cm long; corolla rose, 13-15 mm long, p. 25 . . . . . 43. Salvia trichopes Epling
- Ao. Blades 4-11 cm long, 5 cm wide; corolla blue Ap.
- Ap. Blsdes long-attenuate at base, to 8 cm long, 5 cm wide; petioles winged; pedicels 2-4 mm long; calyx 4-5 mm long; corolla white to blue, 5-6 mm long; herb, p. 24 38. Salvia longimarginata Briq.

- Ap. Blades rounded-truncate, usually abruptly decurrent at base; petiole not winged except at summit; corolla blue Aq.
- Aq. Blades 4-6 cm long; calyx hispidulous on nerves only, at flowering time 7 mm long; petioles 1-5 cm long; corolla blue, tube 16-24 mm long; herb, p. 24 . . . . . 37. Salvia tiliaefolia Vahl
- Aq. Blades 6-11 cm long; petioles 1-3.5 cm long; corolla blue Ar.
- Ar. Pedicels 2-4 mm long; calyx 5.5-8 mm long; clusters 6-12-flowered; racemes 7-10 cm long; corolla 7-10 mm long; herb or shrub, p. 24 . . . . . 39. Salvia pteroura Briq.
- Ar. Pedicels 8-10 mm long; calyx at least 11-12 mm long; clusters mostly 3-flowered; racemes 20-40 cm long; corolla-tube 17-18 mm long; shrub, p. 25 . . . . . 46. Salvia phaenostemma Donn. Sm.
- Ae. Blades hairy beneath at least on veins As. cp. p. 14
- As. Blades hastate-cordate at base; calyx at least 4-10 mm long; flowers remote, not clustered; corolla blue, tube 16-22 mm long; herb, p. 25 47. Salvia cacaliaefolia Bth.
- As. Blades not hastate, sometimes cordate At.
- At. Stem with long spreading hairs; calyx green Au.
- Au. Hairs of stem brown; pedicels 4-5 mm long; calyx glabrous, in flower 12 mm long; blades scabrous above, soft-hairy beneath, p. 21 . . . . . 8. Salvia opertiflora Epling
- Au. Hairs of stem white; calyx densely hairy; blades hairy above and beneath Av.
- Av. Calyx at least 20 mm long; blades 7-14 cm long; corolla rose-red, 5-6 cm long; pedicels 6-8 mm long; herb, p. 25 . 52. Salvia dorisiana Standley
- Av. Calyx at least 7-12 mm long; pedicels 2-5(-8) mm long; blades usually heart-shaped at base Aw.
- Aw. Blades pilose above, whitish-tomentose beneath, 5-15 cm long; calyx at least 7-12 mm long, viscid-hirsute; axis of raceme viscid-pilose with long spreading hairs; corolla violet or blue, tube 8-15 mm long, p. 25 . . . . . 51. Salvia urica Epling
- Aw. Blades densely soft-hairy above and beneath, 3-6 cm long; calyx at least 7-8 mm long, densely hirtellous; corolla scarlet, tube 13-20 mm long, p. 25 . 53. Salvia coccinea Murray
- At. Stem variously hairy, not with long spreading hairs; blades 2-15 cm long Ax.





- Bd. Calyx greenish, at least 10-15 mm long; pedicels 2-5 mm long Bf. cp. p. 17
- Bf. Blades 1-2.5 cm long, usually obtuse at tip, acute or obtuse at base, with tiny resin globules above and beneath, scabrous on veins beneath, otherwise glabrous; calyx glandular; pedicels 2-5 mm long; corolla rose-red, 16-18 mm long; petioles of larger leaves 7-27 mm long; herb or shrub, p. 24 40. Salvia microphylla HBK.
- Bf. Blades 3-20 cm long, acute or acuminate at tip Bg.
- Bg. Calyx glandular-pilose, at least 11 mm long; blades puberulent on veins beneath, almost glabrous, cuneate at base, 3-8 cm long; axis of inflorescence glandular-pilose; corolla white and purplish, tube 14-17 mm long; herb, p. 25 . . . 50. Salvia flaccida Fern.
- Bg. Calyx not glandular, 10-17 mm long; blades villous beneath and usually above, 5-20 cm long, rounded or obtuse at base; corolla red Bh.
- Bh. Calyx hispidulous; corolla-tube 25-27 mm long; blades 8-20 cm long; herb, p. 20 . . . . .
- . . . . . 3. Salvia curtiflora Epling
- Bh. Calyx hirtellous and puberulent, margins of lobes densely white-puberulent; corolla-tube 33-34 mm long; blades 5-10 cm long; shrub. p. 21 . . . . . 7. Salvia excelsa Bth.
- Bc. Calyx 4-8(-10) mm long in fruit Bi. cp. p. 17
- Bi. Calyx 4.5 mm long; blades acute to attenuate at base, narrow, 1.5-2.5 cm long, 3-6 mm wide, 4-5 times as long as wide; pedicels 2-3 mm long; herb, p. 25 . . . . .
- . . . . . 49. Salvia fratrum Standley
- Bi. Calyx 7-10 mm long; blades obtuse or rounded or truncate at base, at least lower leaves thus Bj.
- Bj. Stem tomentose as well as hirsute; blades acute or acuminate at tip, hirsute to glabrous above, tomentose beneath; calyx 8-10 mm long; veins elevated on young blades; longest petioles 1.5-1.7 cm long; corolla purple or magenta, tube 10-12 mm long; shrub. p. 25 . . . . .
- . . . . . 55. Salvia areolata Epling
- Bj. Stem pilose, not tomentose, not hirsute Bk.
- Bk. Calyx hairy, not glandular, at least 7-8 mm long Bl. cp. p. 19
- Bl. Blades 3-4 cm long, hirtellous above and beneath; petioles 5-6 mm long; racemes 3-4 cm long, interrupted; pedicels 5 mm long; corolla purple, tube 12 mm long; stem suffrutescent, p. 25 . . . . . 48. Salvia sparsiflora Epling

- Bl. Blades 4-6 cm long, sparsely hairy above and beneath or glabrous; petioles 1-5 cm long; racemes 15-30 cm long; pedicels 1-3 mm long; corolla blue, tube 4 mm long; herb; cp. pp. 16, 24 . . . . . 37. Salvia tiliaefolia Vahl
- Bk. Calyx glandular-hairy; herb Bm.
- Bm. Blades 5-18 cm long, acute to acuminate at tip; axis of inflorescence densely finely hairy, often glandular; pedicels 1-6 mm long; calyx 5-8 mm long Bn.
- Bn. Blades puberulent or nearly glabrous above, puberulent on nerves beneath; calyx extended into tail-like tip, tip 2 mm long; calyx in age 5-6 mm long; corolla red, tube 15-25 mm long, p. 21 . . . . . 10. Salvia cinnabarina Mart. & Gal.
- Bn. Blades villosulous above and beneath; calyx not extended into tail-like tip; calyx 6-8 mm long after flowering; corolla purple to white, tube 7-10 mm long, p. 23 . . . . . 24. Salvia gracilis Bth.
- Bm. Blades 1.5-4.5 cm long; corolla blue Bo.
- Bo. Blades puberulent or hirtellous on veins beneath, obtuse or rounded at tip; petioles 1.2-1.8 cm long; corolla-tube 4-6 mm long; calyx in fruit 6-8 mm long, p. 21 . . . . . 11. Salvia micrantha Vahl
- Bo. Blades sparsely villous or hirsute above and beneath, acute or obtuse at tip; calyx after flowering 1-2 mm long; corolla-tube 2.5-3 mm long; cp. p. 14, 20 . . . . . 2. Salvia misella HBK.

1. Salvia occidentalis Sw., Prodr. Veg. Ind. Occ. 14. 1788.

Salvia obscurum Bth., Lab. Gen. & Sp. 245. 1833.

Florida (FLAS), Mexico, British Honduras to Salvador and Panama, W. I., S. A., Fl. Guatemala 9:293. 1973.

Nicaragua:

Zelaya, Corn Is. Nelson 4367 (B, DUKE, ENAG, FLAS, MSC, SEYM),

Siuna. Atwood 3179 (MO, SEYM).

Nueva Segovia, Dipilto. Marshall 6396 (ENAG).

Plan Grande. Nelson 5122 (ENAG, SEYM, US, YU).

Madriz, Yalaguina. Hamblett 931 (BM, ENAG, F, GH, MICH, MO, NY, SEYM, SMU, UC, WDP);  
Moore 940 (FLAS, NY); Seymour 965 (BM, ENAG, F, GH, MO, NY, SEYM, SMU, UC, WDP).

Esteli, Mechapa. Atwood 986 (SEYM); Dudey 1027 (MO, UC).

1. Salvia occidentalis Sw., cont.

Boaco, Boaco. Nichols 1476 (SEYM); Seymour 3866 (BM).  
 Chontales, Acoyapa. Dudey 1670 (ENAG, SEYM, SMU, WDP);  
 Nichols 1739 (SEYM);  
 Marshall & Neill 7079 (SEYM).

Juigalpa. Nichols 1643 (SEYM, WDP).

Chinandega, Chinandega. Baker 130, 2036 (GH).

Managua, Tipitapa. Hamblett 10 (BM, ENAG, F, GH, SMU);  
 Zelaya 47 (SEYM).

Managua?, Sierra de Managua. Grant 1026, 1055 (GH).

Granada, Volcan Mombacho. Nichols 2006 (NY, SEYM).

Carazo, Santa Teresa. Dudey 1286 (BM, DUKE, ENAG, F,  
 FLAS, GH, MICH, MO, NY, SEYM,  
 SMU, UC, WDP, WIS);  
 Nichols 1317 (SEYM).

Rivas, La Virgen. Hamblett 1203 (UC); Seymour 1238 (VT).

Penas Blancas. Narvaez 1836 (BM, ENAG, F, GH, MO,  
 NY, SEYM, SMU, UC, WDP, WIS).

2. Salvia misella HBK., Nov. Gen. & Sp. Pl. 2:290. 1817.

Salvia riparia HBK., Nov. Gen. & Sp. Pl. 2:300. 1817,  
 syn. nov.

Calyx after flowering 1-2 mm long.

Mexico, Central America, W. I. to Peru, Gulf of Fonseca.

Nicaragua:

Managua, Managua. Garnier A1382 (GH).

Between Managua and Sabana Grande.

Greenman & Greenman 5684 (GH).

Chinandega, Gulf of Fonseca. May be in Nicaragua (GH).

3. Salvia curtiflora Epling, Fedde Rep. Sp. Nov. Beih. 110:340.  
1939. Guatemala. Calyx after flowering 10-17 mm long.4. Salvia holwayi Blake, Proc. Biol. Soc. Wash. 33:113. 1920.  
Type: Volcan de Agua, Holway 579.

Pedicels 2-6 mm long.

a. Leaves glabrous; Mexico, Guatemala . . . . . var. holwayi

a. Leaves densely or sparsely puberulent . . . . .  
 . . . . . var. puberulenta L. Wms.  
 Fl. Guatemala 9:286. 1973.

5. Salvia karwinskii Bth., Lab. Gen. & Sp. 725. 1835.

Salvia siguatepequensis Standley, Journ. Arnold Arb. 11:40.  
1930.

Calyx after flowering 13-16 mm long.

S. Mexico, Guatemala, Honduras, Salvador, Nicaragua, Fl. Guatemala 9:287. 1973.

6. Salvia wagneriana Polak., *Linnaea* 41:591. 1877.  
 Illustr., *Fl. Panama* 57:80. 1969.  
*Salvia tonduzii* Briq., *Ann. Conserv. Jard. Bot. Geneve*  
 2:157. 1898.  
 Larger leaves 8-13.5 cm long, 3.5-7 cm wide. Pedicels 3-8  
 mm long.  
 Guatemala, Salvador, Nicaragua, Costa Rica, Panama (FLAS),  
 Fl. Guatemala 9:300. 1973.  
 Nicaragua:  
 Jinotega, Ocotillo near Santa Lastenia. Williams et aliis 27847  
 (GH).
7. Salvia excelsa Bth. in *Lindley Bot. Reg.* 27:90. 1841.  
 Pedicels 2-5 mm long.  
 S. Mexico, Guatemala, Fl. Guatemala 9:282. 1973.
8. Salvia opertiflora Epling, *Bull. Torr. Bot. Club* 68:568. 1941.  
 Guatemala. Known only from the type, Steyermark 31469.  
 We have seen no specimen of this species.
9. Salvia hispanica L., *Sp. Pl.* 25. 1753.  
 Florida (FLAS), central & southern Mexico, Guatemala, Sal-  
 vador, Fl. Guatemala 9:284. 1973.  
 Nicaragua: Nueva Segovia, Plan Grande. Nelson 5129 (SEYM).  
 Granada, Granada. Baker 4866 (GH).
10. Salvia cinnabarina Mart. & Gal., *Bull. Acad. Brux.* 11,  
 part 2:63. 1844. Illustr., *Fl. Guatemala* 9:279. 1973.  
 Pedicels 2-4 mm long. Calyx with glandular hairs. S. Mexico,  
 Guatemala, Honduras salvador, Fl. Guatemala 9:279. 1973.
11. Salvia micrantha Vahl, *Enum. Pl.* 1:235. 1805.  
 Longest petioles 1.2-1.8 cm long. Pedicels 1-3 mm long.  
 Florida (FLAS), Yucatan, Honduras, Panama, W. I., Fl.  
 Guatemala 9:291. 1973.  
 Nicaragua:  
 Nueva Segovia, Ocotal. Nichols 832 (VT).  
 Chontales, Juigalpa. Hamblett 1615 (BM, ENAG, F, GH, MO,  
 SEYM, SMU, UC, WDP).  
 Leon, Telica. Dudey, Hamblett & Nichols 202 (VT).  
 Managua, Managua. Dudey, Hamblett & Nichols 185 (BM,  
 ENAG, F, GH, MO, SEYM, SMU).  
 Masaya, Lake Masaya. Hamblett 83 (ENAG, GH, NY, SEYM,  
 SMU).  
 Rivas, La Virgen. Atwood 1181 (VT).
12. Salvia splendens Sellow, ex Roemer & Schultes, *Syst. Veg.*  
*Mant.* 1:185. 1822.  
 Larger blades 6-9 cm long, 4-5.5 cm wide. Flowering calyx 2  
 cm long. Florida (FLAS), Guatemala, Salvador, Brazil,  
 Fl. Guatemala 9:298. 1973.

13. Salvia mocinnoi Bth., Lab. Nov. Gen. & Sp. 271. 1833.  
Corolla sky-blue to violet.  
Mexico (GH), Honduras, Salvador, Fl. Guatemala 9:292. 1973.  
Nicaragua:  
Nueva Segovia, Jalapa. Atwood, Marshall & Neill 6821 (BM,  
ENAG, F, FLAS, GH, MO, NY, SEYM, SMU,  
UC).  
Jinotega, Jinotega. Grant 7286 (GH).
14. Salvia fracta L. Wms., Fieldiana, Bot. 34:110. 1972.  
Guatemala. Type: Williams, Molina & Williams 26069.
15. Salvia miniata Fern., Proc. Amer. Acad. 35:545. 1900.  
Veins of blades not elevated as in Salvia disjuncta.  
Mexico, British Honduras, Guatemala, Fl. Guatemala 9:  
292. 1973.
16. Salvia grandis Epling, Bull. Torr. Bot. Club 71:492. 1944.  
Guatemala. Type: Steyermark 43047.  
We have seen no specimen of this species.
17. Salvia hyptoides Mart. & Gal., Bull. Acad. Brux. 11, 2:74.  
1844. Illustr., Fl. Panama 56:75. 1969.  
Flowers sessile. Mexico to Panama, n. S. A.  
Nicaragua:  
Zelaya, Madregara. Seymour 3276 (MO, SEYM).  
Nueva Segovia, Jalapa. Atwood, Marshall & Neill 6821 (BM,  
ENAG, F, FLAS, GH, MO, MSC, NY,  
SEYM, SMU, UC).  
Ocotal. Dudey 784 (SEYM); Hamblett 799  
(ENAG, WIS); Nichols 825a (B, MICH);  
Seymour 862 (ENAG).  
Chontales, Acoyapa. Nichols 1738 (F, SEYM).  
Leon, Telica. Dudey, Hamblett & Nichols 204 (BM, ENAG, GH,  
SEYM, SMU).  
Managua, El Crucero. Atwood & Neill 6763 (SEYM).
18. Salvia rubiginosa Bth. in DC. Prodr. 12:301. 1848.  
Bracts 9-15 mm long, 12-16 mm wide.  
S. Mexico, Guatemala, Fl. Guatemala 9:273. 1973.
19. Salvia shannonii Donn. Sm., Bot. Gaz. 19:256. 1894.  
Mexico, Guatemala, Honduras, Salvador, Fl. Guatemala 9:397  
1973.
20. Salvia leucochlamys Epling, Bull. Torr. Bot. Club 67:515.  
1940. Guatemala, Fl. Guatemala 9:290. 1973.
21. Salvia lasiantha Bth., Lab. Gen. & Sp. 276. 1833.  
Calyx after flowering 1-1.5 cm long. Larger blades 3-7(-13)  
cm long. S. Mexico, Guatemala.
22. Salvia pittieri Briq., Bull. Soc. Bot. Belg. 30, part 1:237.  
1891. Endemic in Costa Rica.

23. Salvia lavanduloides HBK., Nov. Gen. & Sp. 2:287. 1817.  
Petioles of larger leaves 1-5(-10) mm long. Calyx-teeth acute to short-tapered. Central & s. Mexico, Guatemala, Honduras, Fl. Guatemala 9:289. 1973.
24. Salvia gracilis Bth., Lab. Gen. & Sp. 258. 1833.  
Salvia membranacea Bth., Lab. Gen. & Sp. 259. 1833.  
Salvia irazuensis Fern., Proc. Amer. Acad. 35:540. 1900.  
Pedicels 1-6 mm long. Calyx after flowering 6-8 mm long.  
Mexico, Guatemala, C. R., Panama, Fl. Guatemala 9:283. 1973.
25. Salvia purpurea Cav., Icon. 2:52, t. 166. 1973.  
Central & southern Mexico, Guatemala, Honduras,  
Fl. Guatemala 9:296. 1973.
- Nicaragua:  
Nueva Segovia, Jalapa. Atwood, Marshall & Neill 6867 (BM, ENAG, F, FLAS, GH, MICH, MO, NY, REED, SEYM, SMU, UC).
- Jinotega, Jinotega. Moore 2109 (BM, ENAG, F, GH, MO, NY, SEYM, SMU, UC, WDP).
- Matagalpa, Matagalpa. Zelaya 975 (BM, ENAG, F, GH, MO, NY, SEYM, SMU, UC, WDP, WIS).
26. Salvia polystachya Ortega, Hort. Matr. Dec. 55. 1797.  
Salvia compacta Kuntze, Rev. Gen. 530. 1891.  
Salvia cataria Briq., Ann. Conserv. Jard. Bot. Geneve 2: 142. 1898.  
Petioles of larger leaves 2-4 cm long. Pedicels 0.5-2 mm long.  
Mexico through Central America to Panama,  
Fl. Guatemala 9:295. 1973.
27. Salvia farinacea Bth., Lab. Gen. & Sp. 274. 1833.  
Pedicels 1-2(-3) mm long. Sw. United States, ne. Mexico, Guatemala, Salvador, Fl. Guatemala 9:282. 1973.
28. Salvia nana HBK., Nov. Gen. & Sp. Pl. 2:289. 1817.  
Central & s. Mexico, Guatemala, Fl. Guatemala 9:293. 1973.
29. Salvia disjuncta Fern., Proc. Amer. Acad. 35:533. 1900.  
Veins elevated. Calyx after flowering 12-15 mm long.  
Mexico, Guatemala, Fl. Guatemala 9:281. 1973.
30. Salvia alariformis L. Wms., Fieldiana, Bot. 34:108. 1972.  
Petioles of larger leaves mostly 3-5 mm long. Pedicels 3-7 mm long. Guatemala, Honduras, Fl. Guatemala 9:277. 1973.
31. Salvia maxonii Epling, Fedde Rep. Sp. Nov. Beih. 110:276.  
Largest leaves 5-7 cm wide. Pedicels 2-4 mm long.  
Guatemala. Known only from the type, Maxon 3569.
32. Salvia kellermanii Donn. Sm., Bot. Gaz. 56:60. 1913.  
Illustr., Fl. Guatemala 9:288. 1973. Petioles 1-5 cm long.  
Guatemala, Honduras, Salvador, Fl. Guatemala 9:287. 1973.

33. Salvia guarinae Standley, Ceiba 1:44. 1950. Honduras.

In the original description, this species is said to be much like Salvia kellermanii except for the latter's "quite glabrous calyx". Some of the clearest distinctions are here tabulated.

<u>Salvia guarinae</u> Standley	<u>Salvia kellermanii</u> Donn. Sm.
Calyx hispidulous on nerves	Calyx quite glabrous
Bracts long-persistent	Bracts caducous
Pedicels up to 6 mm long	Flowers sessile

34. Salvia leptophylla Bth., Lab. Gen. & Sp. 249. 1833.

W. Texas, Mexico (FLAS), Guatemala, Fl. Guatemala 9:290. 1973.

35. Salvia costaricensis Oersted, Vid. Medd. Kjoebenhavn 1852: 39. 1853. Endemic in Costa Rica, Fl. C. R. 1027. 1938.

36. Salvia drymocharis Epling ex Standley, Field Mus. Pub. Bot. 18:1028. 1938. Rep. Spec. Nov. Beih. 110:258. 1939. Costa Rica.

37. Salvia tiliaefolia Vahl, Symb. Bot. 3:7. 1794.

a. Calyx in flower 4-5.5 mm long, glabrous or nearly so . . . . . var. albiflora (Mart. & Gal.) L. Wms.

a. Calyx in flower 7-8 mm long b.

b. Calyx glabrous or nearly so . . . . . var. alvajaca (Oersted) L. Wms.

b. Calyx hispidulous on nerves only . . . . . var. tiliaefolia

Salvia tiliaefolia Vahl var. tiliaefolia. Petioles 1-5 cm long.

Pedicels 1-3 mm long. Mexico to Panama, n. S. A.

Nicaragua:

Esteli, Cerro Santa Rosa. Seymour 7630 (MO, SEYM, UCA).

Salvia tiliaefolia Vahl var. albiflora (Mart. & Gal.) L. Wms., Fieldiana, Bot. 34:113. 1972. Mexico, Guatemala, Honduras, Panama, Fl. Guatemala 9:299. 1973.

Salvia tiliaefolia Vahl var. alvajaca (Oersted) L. Wms., Fieldiana, Bot. 34:113. 1972.

Salvia alvajaca Oersted, Dansk. Vid. Medd. 1853:38, f.2. 1853.

Salvia ourophylla Briq., Ann. Conserv. Jard. Geneve 2:126. 1898.

Salvia permixta Briq., Ann. Conserv. Jard. Geneve 2:129. 1898. Illustr., Fl. Panama 56:79. 1969. Guatemala, Costa Rica.

Nicaragua: Matagalpa, Tuma. Atwood 3970 (BM, ENAG, FLAS, GH, MO, NY, SEYM, SMU).

38. Salvia longimarginata Briq., Ann. Conserv. Jard. Bot. Geneve 2:127. 1898.

Central America, Colombia, Venezuela, Fl. Panama 56:78. 1969.

39. Salvia pteroura Briq., Ann. Conserv. Jard. Bot. Geneve 2: 139. 1898. Costa Rica, Panama, Fl. Panama 56:76. 1969.

40. Salvia microphylla HBK., Nov. Gen. & Sp. 2:294. 1817.

Non Salvia microphylla Sesse & Moc. 1893.

Leaves with tiny resin globules above and beneath, beneath slightly scabrous, otherwise glabrous. Petioles 7-27 mm long. Mexico (FLAS), Guatemala.



41. Salvia pansamalensis Donn. Sm., Bot. Gaz. 23:249. 1897.  
Guatemala. Leaves glabrous except sparsely hairy on  
veins beneath.
42. Salvia bella Briq., Ann. Conserv. Jard. Bot. Geneve 2:169.  
1898. Costa Rica.
43. Salvia trichopes Epling, Bull. Torrey Bot. Club 68:564. 1941.  
Known only from type collection, Panama, Chiriqui,  
Woodson & Schery 693 (Isotype MO).
44. Salvia recurva Bth. in DC. Prodr. 12:336. 1848.  
Blades covered above with short harsh, not erect hairs  
with swollen bases. Longer petioles 6-12 cm long. Pedi-  
cels 4-13 mm long. S. Mexico, Guatemala.
45. Salvia subrubens Epling, Fedde Rep. Sp. Nov. Beih. 110:  
335. 1939. Guatemala.
46. Salvia phaenostemma Donn. Sm., Bot. Gaz. 23:13. 1897.  
Guatemala.
47. Salvia cacaliaefolia Bth. in DC. Prodr. 12:348. 1848.  
Mexico, Guatemala, Honduras, Fl. Guatemala 9:278. 1973.
48. Salvia sparsiflora Epling, Bull. Torrey Bot. Club 71:494.  
1944. Guatemala. Known only from type, Steyermark 51740.
49. Salvia fratrum Standley, Fieldiana, Bot. 18:1028. 1938.  
Costa Rica.
50. Salvia flaccida Fern., Proc. Amer. Acad. 35:509. 1900.  
Pedicels 2-5 mm long.  
Mexico, Guatemala, Fl. Guatemala 9:282. 1973.
51. Salvia urica Epling, Fedde Rep. Sp. Nov. Beih. 10:175.  
1939. Pedicels 2-5(-8) mm long. Mexico, British Hon-  
duras, Guatemala, Honduras, Fl. Guatemala 9:300. 1973.
52. Salvia dorisiana Standley, Ceiba 1:43. 1950. Honduras.
53. Salvia coccinea Juss. ex Murray, Comm. Goett. 1:86, t. 1.  
1788. Larger blades 2.5-4(-5) cm wide. Pedicels 3-5  
mm long. S. United States, Florida (FLAS), Mexico,  
British Honduras, Guatemala, Salvador, W. I., S. A.,  
Fl. Guatemala 9:280. 1973.
54. Salvia iodochroa Briq., Ann. Conserv. Jard. Bot. Geneve  
2:161. 1898. Endemic in Costa Rica, Fl. C. R. 18:  
1029. 1938.
55. Salvia areolata Epling, Bull. Torrey Bot. Club 71:493. 1944.  
Blades rounded or widely cuneate at base. Longest petioles  
1.5-1.7 cm long.  
Endemic in Guatemala, Fl. Guatemala 9:278. 1973.

10. LEPECHINIA Willdenow

Herbs, usually, in Central America, sometimes shrubs.  
Leaves crenate or dentate, lower ones on long petioles, upper  
ones sessile. Flower-clusters in terminal, often interrupted

spikes. Calyx often slightly 2-lipped, the 5 teeth almost equal. Corolla 2-lipped, lips almost equal. Stamens 4; anther-cells divergent or parallel. Nutlets ovate, smooth, black.

In Lepechinia, the lower lip of the corolla is plane; in Hyptis and Marsypianthes, the lower lip is saccate. In Lepechinia, the stamens and style are included in the corolla, whereas in Stachys they are exerted.

- A. Stems with fine or short hairs, some hairs branched; spikes very dense; corolla about equal to calyx . . . . . 3. Lepechinia caulescens (Ortega) Epling
- A. Stems with longer spreading hairs B.
- B. Stems hirsute-villous; blades 8 cm long, 4 cm wide, obtuse at tip, truncate at base; pedicels 2 mm long; clusters distant . . . . . 2. Lepechinia alpina (Oersted) Standley
- B. Stems with long spreading white hairs; flowers on short pedicels; clusters distant; corolla shorter than calyx . . . . . 1. Lepechinia schiedeana (Schlecht.) Vatke
1. Lepechinia schiedeana (Schlecht.) Vatke, Verh. Bot. Ver. Brandenb. 36. 1875. Illustr., Fl. Panama 56:109. 1969 Fl. Guatemala 9:263. 1973. Central America.
2. Lepechinia alpina (Oersted) Standley, Fieldiana, Bot. 18: 1023. 1938.. Costa Rica.
3. Lepechinia caulescens (Ortega) Epling, Repert. Sp. Nov. Beih. 85:20. 1935. Central & s. Mexico, Guatemala, Fl. Guatemala 9:262. 1973.

#### 11. HEDEOMA Persoon

Herbs. Leaves entire or dentate. Flowers in clusters in axils of leaves, on pedicels (in ours) or in terminal racemes. Calyx 13-nerved, 5-toothed, teeth filiform, almost equal, or lower teeth longer than upper, hairy in throat. Corolla 2-lipped, one lip erect, the other spreading. Stamens 2. Nutlets ovoid, smooth.

1. Hedeoma costatum Hemsley, Biol. Cent. Amer. Bot. 2:547. 1882. Illustr., Fl. Guatemala 9:247. 1973.
- Stem slender, densely hairy. Leaves 7-20 mm long, ovate, acute or obtuse, obtuse or rounded at base. Calyx hispidulous. Corolla purple, 16-18 mm long.
- Mexico; coll. once in Guatemala., Fl. Guatemala 9:246. 1973.

12. SATUREJA Linnaeus

Herbs or shrubs. Leaves dentate or entire. Flowers (in Central America) solitary on pedicels in axils of leaves. Calyx 10-15-nerved, slightly 2-lipped, 3 upper teeth joined, throat glabrous or pilose. Corolla 2-lipped, upper lip erect, the lower spreading, 3-lobed. Stamens 4, in pairs, glabrous, anther-cells divergent. Nutlets oblong or ovate, smooth.

A. Calyx 3.5-4 mm long; throat not hairy; corolla-tube 3.5 mm long; herb, up to 20 cm tall; blades 5-12 mm long; stems glabrous or nearly so . . . 1. Satureja brownei (Sw.) Briq.

A. Calyx 7 mm long; throat densely hairy; corolla 3 cm long; shrub up to 2 m tall; blades 1.5-3.5 cm long; young stems puberulent with recurved hairs . . . . . 2. Satureja seleriana Loesener

1. Satureja brownei (Sw.) Briq. in Engler & Prantl, Pflanzenfam. IV, 3a:300. 1897.

Micromeria brownei (Sw.) Bth., Labiat. 372. 1834.

S. United States, Florida, Mexico, Honduras, Costa Rica, W. I., nw. S. A., Fl. Guatemala 9:301. 1973.

2. Satureja seleriana Loesener, Verh. Bot. Ver. Brandenb. 51: 35. 1909. Illustr., Fl. Guatemala 9:303. 1973.

Mexico, Guatemala.

13. CHAUNOSTOMA Donnell Smith

Shrubs. Hairs branched. Leaves crenate. Petioles short. Flowers in axillary racemes; racemes shorter than leaves. Calyx 5-lobed; lobes almost equal. Corolla 2-lipped. Stamens 4, much exerted. Nutlets oval, smooth.

1. Chaunostoma mecisandrum Donn. Sm., Bot. Gaz. 20:9, t. 3. 1895. Illustr., Fl. Guatemala 9:242. 1973. The only species. Stellate-tomentose. Leaves 9-15 cm long, 2-5 cm wide, with yellow glands above and beneath. Calyx blue, 8 mm long. Nutlets 2 mm long. Mexico, Guatemala, Fl. Guatemala 9:241. 1973.

14. THYMUS Linnaeus

Thyme

Herbs or dwarf shrubs. Leaves small, entire. Flowers dense, terminal or axillary. Calyx 13-nerved, hairy in throat, 2-lipped, upper lip 3-toothed, the lower 2-cleft. Corolla 2-lipped, upper lip notched at tip, the lower 3-cleft. Stamens 4, anther-cells parallel or divergent. Nutlets ovoid or oblong, smooth.

1. Thymus vulgaris L., Sp. Pl. 591. 1753.  
Calyx 3-5 mm long, hirtellous. Corolla lilac or pink, 4-6 mm long. Europe, Florida (cult.) (FLAS), Guatemala.
15. CUNILA Linnaeus  
Herbs or shrubs. Leaves small. Flowers axillary or terminal, in cymes or spikes or heads. Calyx equally 5-toothed, 10-13-nerved. Corolla 2-lipped, white or purplish. Perfect stamens 2. Nutlets ovoid or oblong, smooth.
1. Cunila polyantha Bth., Labiatae 362. 1834.  
Illustr., Fl. Panama 56:82. 1969; Fl. Guatemala 9:245. 1973. Shrub, arching or climbing. Branches hairy. Petiole short. Blades 2-5 cm long, acute or acuminate, rounded at base, glandular-dotted. Flowers in clusters. Pedicels long. Calyx 3 mm long, slightly hairy; teeth acuminate. Corolla 4 mm long, white.  
S. Mexico, Guatemala, Honduras, Costa Rica, Panama, Fl. Panama 56:83. 1969.
16. MENTHA Linnaeus  
Herbs. Leaves toothed. Petioles commonly short. Flowers in axils of leaves or in dense terminal spikes. Calyx cup-shaped or tubular, 10-nerved, 5 lobes equal or nearly so. Corolla almost equally 4-toothed. Stamens 4. Nutlets ovoid, smooth.
1. Mentha citrata Ehrh., Beitr. 7:150. 1792.  
Europe, Guatemala.
17. HYPTIS Jacquin  
Herbs or shrubs. Flowers in axils of leaves in heads or in spikes or panicles. Calyx-teeth 5, about equal, acute to subulate, often hairy. Corolla-lobes 5, nearly equal. Stamens 4. Nutlets ovoid or oblong, smooth or roughened.  
Distinguished from Stachys by the corolla-lobes being nearly equal and the middle lobe of lower lip being dipper-shaped (saccate). Hyptis and Marsypianthes differ from Stachys in the stamens being declined toward the lower lip of the corolla.
- Combined key to Hyptis, Marsypianthes, Lepechinia and Stachys, as the generic differences are largely in flowers, --characters not present in fruit.

- A. Flowers not in dense globose heads, in clusters (verticils), 3-12-flowered, often not on peduncles, sometimes sessile in axils of leaves B.
- B. Calyx-teeth widely spreading in fruit; flowers sessile in clusters in long slender spikes, leafy-bracted or not C.
- C. Calyx-teeth 2.5-3.5 mm long, subulate (awl-like), spinose; blades 3-8 cm long, densely hairy above and beneath; corolla-tube 3 mm long; shrub, erect or arching, p. 33. . . . . 2. Hyptis mocinniana Bth.
- C. Calyx-teeth 3.5-4.5 mm long, deltoid-lanceolate, pilose or glabrous; blades 5-13 cm long, hairy above, below hairy on veins only; corolla-tube 18-23 mm long; usually a vine, p. 29 . . . . . Stachys lindenii Bth.
- B. Calyx-teeth erect or slightly spreading or connivent in fruit D.
- D. Calyx in fruit 1-2.5 mm long; bracts persistent; calyx-teeth erect or connivent in fruit; blades 2-8 cm long E.
- E. Calyx with conspicuous tuft of white hairs in throat, teeth filiform-subulate; bracts linear; blades cuneate to subcordate at base, densely hairy beneath; corolla-tube 1.5 mm long, p. 34. . . . .  
. . . . . 4. Hyptis pectinata (L.) Poiteau
- E. Calyx without conspicuous tuft of white hairs in throat, teeth triangular, obtuse; bracts setaceous; blades acute to attenuate at base, almost glabrous; corolla 3 mm long, p. 33 l. Hyptis verticillata Jacq.
- D. Calyx in fruit (3-4-12 mm long including teeth; peduncles 0-2 cm long F.
- F. Calyx-teeth deltoid to lanceolate, widened toward base, spine-tipped, 0.5-4.5 mm long; calyx hairy to glabrous G.
- G. Calyx reticulate-veined, 12 mm long in fruit; bracts usually ovate; flowers in terminal, usually interrupted spikes, p. 25. . . . . Lepechinia
- G. Calyx not reticulate-veined, 3-8 mm long in fruit H.
- H. Plant a climbing shrub; calyx-tube 4 mm long, teeth 0.5 mm long, p. 35 . . . . .  
. . . . . .6. Hyptis scandens Epling
- H. Plant an herb I.
- I. Nutlets hemispheric, with fringed margins; calyx 6-8 mm long, densely hairy, teeth 2.5 mm long; stems prostrate, forming mats; corolla about equaling calyx, p. 39  
Marsypianthes chamaedrys (Vahl) Kuntze

- I. Nutlets obovate, not fringed; calyx-tube 3-7 mm long, pilose to glabrous, teeth (1-)2-4.5 mm Long; stems erect to prostrate, p. 8. . . Stachys
- F. Calyx-teeth setaceous or subulate, scarcely widened at base, nerves hairy; calyx 4-7 mm long in fruit, teeth 1-2 mm long J.
- J. Blades almost glabrous above and beneath; calyx-teeth 2 mm long; flowers ascending in dense uninterrupted spikes; corolla-tube 4 mm long, p. 35 . . . . . 7. Hyptis americana (L.) Poiteau
- J. Blades hairy above and beneath or rarely glabrate K.
- K. Calyx in fruit 7-9 mm long, teeth 2 mm long; bracts spreading, shorter than calyx, not concealing it; corolla-tube 4-6 mm long; herb, p. 33 . . . . . 3. Hyptis suaveolens (L.) Poiteau
- K. Calyx in fruit 2-4 mm long, teeth 1-1.5 mm long; corolla-tube 3-4 mm long L.
- L. Bracts conspicuous, ovate or elliptic, appressed, longer than calyx, often concealing it; herb, p. 35 . . . . . 5. Hyptis mutabilis (A. Rich.) Briq.
- L. Bracts inconspicuous, filiform or linear, sometimes hidden under wooly hairs; calyx wooly; tree, p. 36 . . . . . 13. Hyptis arborescens Epling
- A. Flowers in dense, many-flowered heads, often globose when mature, usually on peduncles M.
- M. Calyx-tube glabrous or nearly so outside, in Hyptis atrobubens, pilose at base and teeth only; heads 1-2.5 cm thick P.
- N. Blades abundantly hairy above and beneath; peduncles 0.5-4 cm long; calyx 2-5 mm long; corolla-tube 5-6 mm long O.
- O. Calyx-tube recurved in age, teeth 1-1.2 mm long; blades 3-9 cm long; heads 1-1.5 cm thick; peduncles 2-4 cm long; bracts hidden, p. 35 . . . . . 10. Hyptis recurvata Poiteau
- O. Calyx-tube not recurved, teeth 1-2.5 mm long; blades truncate or rounded at base; bracts 7-12 mm long P.
- P. Largest blades 6-8 cm long, on petioles, ovate; calyx-tube in fruit 4-7 mm long; heads 2 cm thick; bracts 10-12 mm long, p. 36 . . . . . 12. Hyptis sinuata Bth.

P. Largest blades up to 5 cm long, sessile, oblong-lanceolate; calyx-tube in fruit 2.5-3 mm long; heads 1-1.5 cm thick; bracts 7-10 mm long; inflorescence conspicuously white-hairy, p. 36 .

. . . . . 14. Hyptis dilatata Bth.

N. Blades almost glabrous or puberulent or sparsely villous beneath on veins; peduncles 0.5-7 cm long; calyx-tube almost glabrous or minutely hairy; bracts 4-8 mm long Q.

Q. Calyx-tube 8-10 mm long in fruit; heads axillary, 2-2.5 cm thick; peduncles 2-7 cm long; blades slightly hairy or glabrous, 4-12 cm long; corolla-tube 4-5 mm long, p. 37 . . . . . 23. Hyptis capitata Jacq.

Q. Calyx-tube 3.5-4.5 mm long in fruit; heads 0.8-1.6 cm thick; peduncles 0.5-3 cm long; corolla-tube 2.5-3 mm long; bracts 4-8 mm long R.

R. Blades glabrous above, hirsute or glabrous beneath, cuneate-attenuate at base, 6-12 cm long; calyx-tube almost glabrous, p. 37 20. Hyptis lanceolata Poiret

R. Blades with sparse long hairs above and beneath, rounded at base, 1.5-4 cm long; calyx-tube hairy at base, p. 37 . . . . . 22. Hyptis atrorubens Poiteau

M. Calyx-tube distinctly or abundantly hairy outside, not only at base; blades hairy beneath, not only on veins S.

S. Inflorescence conspicuously white with hairs or tomentose; calyx 2.5 mm long in fruit, teeth 1.5 mm long; peduncles short; blades densely tomentose beneath, up to 8 cm long, 4 cm wide; bracts hidden under wool; shrub, p. 36 . . . . .

. . . . . 11. Hyptis oblongifolia Bth.

S. Inflorescence not conspicuously white with hairs; herb T.

T. Calyx-teeth triangular or lanceolate; heads axillary; peduncles surpassed by leaves, 0-1 cm long; blades hairy above and beneath, sessile or on short petioles; bracts 3-4 mm long U.

U. Bracts filiform V.

V. Calyx 2-3 mm long, teeth 1 mm long, lanceolate; stem with appressed hairs; blades 3-8 cm long; corolla-tube 1-1.5 mm long, p. 15 . . . . .

. . . . . 8. Hyptis pulegioides HBK.

V. Calyx 5-6 mm long, teeth linear-attenuate; stem when young scabrous; hairs stellate; blades 1-3 cm long; corolla pale-purple, about 1 cm long, p. 35 . . . . . 9. Hyptis asperifolia Standley

- U. Bracts ovate-lanceolate; calyx-teeth deltoid; blades 5-10 cm long; corolla-tube 2-3 mm long; peduncles 0-1 cm long
- W. Calyx-teeth 0.7-1 mm long, tube about 1.5 mm long; blades acute at each end, resin-dotted, p. 36 . . . . . 17. Hyptis obtusiflora Presl
- W. Calyx-teeth 1.5-2 mm long, tube in fruit 3 mm long; blades acute or obtuse at tip, truncate or acuminate at base, p. 36 . . . . . 18. Hyptis intermedia Epling
- T. Calyx-teeth setaceous to subulate X.
- X. Blades attenuate to base or decurrent on petioles Y.
- Y. Calyx-teeth 1.5-2.5 mm long; peduncles 0.3-1.5 cm long; blades 4-6 cm long; corolla-tube 2.5-3 mm long, p. 36 . . . . . 19. Hyptis brevipes Poiteau
- Y. Calyx-teeth 3-3.5 mm long; peduncles 2.5-5 cm long; blades 7-18 cm long, 0.5-4 cm wide Z.
- Z. Heads hemispherical; bracts hairy; corolla-tube 4.5-5 mm long, p. 38 . . . 25. Hyptis conferta Bth.
- Z. Heads spherical; bracts glabrous; corolla-tube 6-7 mm long, p. 38 . . . 26. Hyptis savannarum Briq.
- X. Blades cuneate or rounded or truncate or cordate at base Aa.
- Aa. Blades sparsely hirsute, sessile; peduncles 3-5 cm long; calyx at least 4 mm long; corolla-tube 4-4.5 mm long, p. 38 . . . . . 24. Hyptis vilis Kunth & Bouche
- Aa. Blades not hirsute; calyx-teeth 1-3.5 mm long Ab.
- Ab. Blades 1.5-3 cm long, scabrous or strigose above, beneath strigose or sericeous or almost glabrous, sessile or petioles 5 mm long; stem appressed pilose or glabrate; calyx-tube in fruit 4-5 mm long, p. 36 . . . . . 15. Hyptis lantanaefolia Poiteau
- Ab. Blades 3-8.5 cm long, hairy above and beneath, not scabrous, not strigose, not sericeous Ac.
- Ac. Stem densely puberulent, hairs mostly recurved; calyx at least 2.5-3 mm long, teeth 1-2.5 mm long; petioles of larger leaves 0.5-3(-3.5) cm long; corolla-tube 3.5-4 mm long, p. 36 . . . . . 16. Hyptis urticoides HBK.
- Ac. Stem densely soft-hairy; calyx at least 5-6 mm long, teeth 2.5-3 mm long; petioles 0.5-1 cm long; corolla-tube 5-6 mm long, p. 37 . . . . . 21. Hyptis brachiata Briq.



1. Hyptis verticillata Jacq., Icon. Pl. Rar. 1:101, t. 113. 1787.  
Mexico (GH), British Honduras to Salvador and Panama,  
W. I., S. A.
- Nicaragua:  
Zelaya, Comarca del Cabo, Waspan. Atwood 3561 (BM,  
ENAG, GH, SEYM, SMU).  
Punta del Mico. Atwood 4244 (SEYM, SMU).  
Nueva Segovia, Jalapa. Seymour 5517 (ENAG, SEYM).  
Chinandega, Aserradores Is. Baker 93, 2126 (GH).  
Chinandega. Baker 103, 2151 (GH).  
Managua, Managua. Grant 1068 (GH).  
Granada, Volcan Mombacho. Nichols 2007 (BM, ENAG, F,  
SEYM, SMU); Nelson 7596 (FLAS, GH, MO, SEYM,  
SMU, UCA).  
Carazo, Santa Teresa. Hamblett 1293 (BM, ENAG, F, GH,  
SMU); Moore 1301 (ENAG, MO, NY,  
SEYM, UC, WDP).  
Rivas, La Virgen. Seymour 1241 (VT).
2. Hyptis mocinniana Bth., Labiat. Gen. & Sp. 129. 1834.  
Illustr., Fl. Guatemala 9:253. 1973.  
Similar to Hyptis stellulata Bth. Calyx-lobes spreading in  
both species, larger and more densely hairy in H. mocinniana.  
Leaves hairy beneath in H. mocinniana; in H. stellulata, leaves  
glabrous.  
Mexico to Costa Rica.
- Nicaragua:  
Madriz, Yalaguina. Nichols 948 (BM, SEYM).  
Chontales, Cuapa. Marshall & Neill 6671 (BM, ENAG, F,  
FLAS, GH, MICH, MO, NY, SEYM, SMU,  
UC).  
Leon, La Paz. Baker 210 (GH).  
Managua, Managua. Dudey, Hamblett & Nichols 166 (B, BM,  
ENAG, F, FLAS, GH, MICH, MO, MSC,  
NY, SEYM, SMU, UC, US, WDP, WIS,  
YU).  
Granada, Volcan Mombacho. Atwood A185 (MSC).  
Carazo, Santa Teresa. Moore 1298 (SEYM, SMU).  
Rivas, San Juan del Sur. Narvaez 1254 (ENAG, F, GH, MO,  
NY, SEYM, SMU, UC, WDP).
3. Hyptis suaveolens (L.) Poiteau, Ann. Mus. Hist. Nat. Paris  
7:472, t. 29, f. 2. 1806.  
Mexico (GH), British Honduras to Panama, W. I., S. A.,  
Old World, Fl. Guatemala 9:257. 1973.
- Nicaragua:  
Zelaya, Between El Centro and La Cruz. Molina 2445 (GH).

- Zelaya, Siuna. Seymour 5022 (SEYM).  
 Nueva Segovia, Dipilto. Marshall 6358 (BM, ENAG, FLAS,  
 GH, MO, NY, SEYM, SMU, UC).  
 Jalapa. Seymour 5523 (VT).  
 Ocotal. Moore 813 (SEYM, SMU, WDP).  
 Boaco, Teustepe. Seymour 2456 (BM, SEYM).  
 Chontales, Acoyapa. Nichols 1740 (ENAG, F, GH, SEYM).  
 Marshall & Neill 6531 (BM, ENAG,  
 FLAS, MO, NY, SMU, UC).  
 Apompua. Seymour 2694 (VT).  
 Drenejé de Lago Granada. Shank & Molina 4591  
 (GH).  
 Juigalpa. Dudev 1604 (NY, UC); Seymour 1647 (VT).  
 Chinandega. Chinandega. Baker 129, 2024 (GH).  
 Leon, Las Lomas-El Diamante. Astacio (ENAG).  
 Managua, Hills behind Managua. Grant 741 (GH).  
 Masaya, Lake Masaya. Hamblett 88 (ENAG, SEYM, WDP).  
 Granada, Granada. Grant 924 (GH).  
 Rivas, La Virgen. Seymour 1240 (VT).  
 Without definite locality. Garnier A1377 (GH).  
 4. Hyptis pectinata (L.) Poiteau, Ann. Mus. Hist. Nat. Paris 7:  
 474, t. 30. 1806. Probable synonym: *Hyptis nicaraguensis*  
 Ortega in Lab. Centroamericanæ pp. 32-42 in Videnskabelige  
 Meddelelser. 1853. Specimen cited coll. in region of Granada.  
 Mexico, British Honduras to Salvador and Panama, W. I.,  
 S. A.  
 Nicaragua:  
 Zelaya, Madregara. Narvaez 3244 (BM, ENAG, F, GH, MICH,  
 MO, NY, SEYM, SMU, UC, WDP, WIS);  
 Nelson 5054 (VT); Seymour 5083 (SEYM).  
 Nueva Segovia, Jicaro. Seymour 6446 (SEYM).  
 Ocotal. Nichols 831 (SMU); Seymour 863 (VT).  
 Matagalpa, Tuma. Atwood 3969 (VT).  
 Boaco, Camoapa. Seymour 3488 (SEYM).  
 Chontales, Apompua. Seymour 2697 (SEYM).  
 Juigalpa. Nichols 1642 (VT).  
 Santo Domingo. Seymour 3411 (SEYM).  
 Rio San Juan, San Carlos. Atwood 2041 (BM, ENAG, NY,  
 SEYM, SMU, UC, WDP).  
 Managua, Masachapa. Nichols 1375 (VT).  
 Managua?, Sierra de Managua. Grant 945, 1082 (GH).  
 Carazo, Casa Colorada. Seymour 566 (MO, SEYM).  
 Santa Teresa. Dudev 1288 (VT); Hamblett 1293a (B,  
 FLAS, MSC, YU).  
 Rivas, Amayo. Astacio (ENAG).

5. Hyptis mutabilis (L. Rich.) Briquet, Bull. Herb. Boiss. 4: 788. 1896.  
Mexico, Honduras and Salvador to Panama, S. A.  
Nicaragua:  
Nueva Segovia, Ocotal. Nichols 826 (VT).  
Matagalpa, Jicaró. Seymour 6447 (SEYM).  
Boaco, Boaco. Seymour 1491 (SEYM, SMU).  
Camoapa. Seymour 3489 (F, MO), 3536 (BM, GH, SEYM).  
Chontales, Cuapa. Marshall & Neill 6672 (BM, ENAG, FLAS, GH, MO, NY, SEYM, SMU, UC).  
Santo Tomas. Seymour 2770 (ENAG, F, GH, MO, NY, SEYM, UC, WDP).  
Chinandega, Chinandega. Baker 124 (GH).  
Department uncertain, Volcan El Viejo. Baker 2174 (GH).  
Masaya, Masaya. Baker 102 (GH).  
Rivas, Ometepe. Smith s. n. (GH).
6. Hyptis scandens Epling, Carnegie Inst. Wash. Publ. 522:239. 1940. Guatemala. Known from the type, only, Lundell 4421.
7. Hyptis americana (Aublet) Urban, Fedde Repert. Sp. Nov. 15: 322. 1918. Hyptis spicigera Lam., Encycl. 3:185. 1789. Inflorescence dense, terminal, cylindrical, not interrupted. Mexico, British Honduras, Guatemala, Honduras, Canal Zone, W. I., S. A., Old World including Africa, Fl. Guatemala 9:248-9. 1973.  
Nicaragua:  
Chontales, Acoyapa. Hamblett 1695 (BM, ENAG, F, GH, MO, NY, SEYM, SMU, UC, WDP).  
Marshall & Neill 7080 (ENAG, FLAS).
8. Hyptis pulegioides Pohl ex Bth., Labiat. Gen. & Sp. 128. 1833. Throughout Central America, n. S. A., Fl. Panama 56:87. 1969.
9. Hyptis asperifolia Standley, Journ. Arnold Arb. 11:40. 1930. Honduras, Dept. Comayagua, near Siguatepeque, Standley 56231 (F), type.
10. Hyptis recurvata Poiteau, Ann. Mus. Hist. Nat. Paris 7: 467, t. 28, f. 1. 1806. Illustr., Fl. Panama 56:89. 1969. S. Mexico, British Honduras, Nicaragua to Panama, S. A.  
Nicaragua:  
Zelaya, Bluefields. Nelson 4122 (GH, MO, SEYM).  
Madregara. Seymour 3104 (NY, SEYM), 3277 (SEYM).  
Chontales, Santo Domingo. Atwood 3348 (SEYM, SMU);  
Seymour 3408 (BM), 3410 (GH).  
Rio San Juan, San Bartolo. Robbins 6177 (BM, ENAG, F, FLAS, GH, MO, NY, SEYM, SMU, UC).  
San Carlos. Atwood 2040 (ENAG, F, GH, MO,

SEYM).

11. Hyptis oblongifolia Bth. in DC. Prodr. 12:125. 1848.  
S. Mexico, Honduras, Nicaragua, Costa Rica, Panama, Fl. Guatemala 9:255. 1973.  
Nicaragua:  
Department uncertain, Volcan El Viejo, Fl. C. R. 1019. 1938.
12. Hyptis sinuata Pohl ex Bth. in Labiat. Gen. & Sp. 103. 1833.  
Nicaragua, Fl. Guatemala 9:256. 1973.
13. Hyptis arborescens Epling, Rep. Sp. Nov. 32:100. 1933.  
Calyx wooly. Nicaragua:  
Department uncertain, Volcan El Viejo. Baker 18 (GH).
14. Hypstis dilatata Bth. in DC. Prodr. 12:103, f. 6. 1848.  
Illustr., Fl. Panama 56:90. 1969. Panama.
15. Hyptis lantanaefolia Poiteau, Ann. Mus. Hist. Nat. Paris 7: 468, t.29, f.1. 1806. Peduncles 1.5-2.5(-7) cm long.  
S. Mexico, British Honduras, Guatemala, Honduras, Nicaragua, Costa Rica, Panama, W. I., S. A., Fl. Guatemala 9:252. 1973.  
Nicaragua:  
Zelaya, Comarca del Cabo, Bilwaskarma. Seymour & Nelson 4715 (GH, MO, SEYM).  
Waspan. Atwood 3639 (FLAS, US, USF, WIS);  
Seymour 3697 (BM, DUKE, ENAG, F, GH, MO, NY, SEYM, SMU, UC, WDP, YU).  
Madregara. Atwood 3237 (BM, ENAG, F, GH, MO, NY, SEYM, SMU, UC, REED).  
Seymour 3279 (B, ENAG, MSC, REED).  
Puerto Cabezas. Nelson 4535 (ENAG, F, MO, SEYM).  
Matagalpa, Tuma. Seymour 4051 (VT).  
Chontales, Santo Tomas. Seymour 2794 (VT).
16. Hyptis urticoides HBK., Nov. Gen. & Sp. 2:320. 1817.  
Petioles of larger leaves 0.5-3(-3.5) cm long. Peduncles 0.3-3 cm long. Mexico to Panama.  
Nicaragua: Managua, Managua. Garnier A1376 (GH).
17. Hyptis obtusiflora Bth., Labiat. Gen. & Sp. 107, f. 7. 1833.  
Illustr., Fl. Panama 56:92. 1969. Panama.  
Calyx about 1.5 mm long  
Zelaya, Madregara. Seymour 3278 (ENAG, F, GH, MO, SEYM).  
Chontales, Santo Domingo. Seymour 3409 (BM, SEYM, SMU).
18. Hyptis intermedia Epling, Bull. Torrey Bot. Club 67:510. 1840. Guatemala. Calyx-tube in fruit 3 mm long.
19. Hyptis brevipes Poiteau, Ann. Mus. Hist. Nat. Paris 7:465. 1906. Heads on peduncles. Mexico to Panama, W. I., S. A.  
Nicaragua:  
Zelaya, Comarca del Cabo, Waspan. Nelson 4864 (ENAG, VT).  
Limbaika. Seymour 4939 (BM, ENAG, F, GH, MO, NY, SEYM; SMU, UC).  
Puerto Cabezas

NY, SEYM, SMU, UC).

Puerto Cabezas. Atwood 4451 (VT).

20. Hyptis lanceolata Poirlet, Encycl. Suppl. 3:114. 1813.  
Guatemala?, W. I., S. A., tropical Africa. "It is closely related to H. brevipes and may not be distinct from that species." Fl. Guatemala 9:252. 1973. We have seen no specimen of this species.
21. Hyptis brachiata Briquet, Ann. Conserv. Jard. Bot. Geneve 2:215. 1898.  
Costa Rica, Panama, Colombia, Venezuela, Fl. Panama 56:93. 1969.  
Nicaragua: Chontales, Santo Tomas. Seymour 2795 (NY, SEYM, UC).
22. Hyptis atrorubens Poiteau, Ann. Mus. Hist. Nat. Paris 7:466, t. 27, f. 3. 1806. Illustr., Fl. Panama 56:94, f. 8. 1969. Heads terminal and axillary.  
S. Mexico, British Honduras, Guatemala, Honduras, W. I., S. A., Fl. Guatemala 9:249. 1973.  
Nicaragua:  
Zelaya, Comarca del Cabo, Bilwaskarma. Seymour 4662 (VT).  
Waspan. Seymour 3589 (BM, F, GH, MO, SEYM, SMU).
23. Hyptis capitata Jacquin, Coll. Bot. 1:102. 1787.  
Heads 2-2.5 cm thick. Peduncles 1-4 cm long.  
S. Mexico to Panama, W. I., S. A., Old World tropics, Fl. Guatemala 9:250. 1973.  
Nicaragua:  
Zelaya, El Bluff. Hamblett 621 (BM, ENAG, F, GH, MO, SEYM, SMU); Seymour 713 (NY, UC).  
El Recreo. Hamblett 454 (VT).  
Madregara. Atwood 3238 (SEYM, SMU).  
Rama. Nichols 307 (VT).  
Nueva Segovia. Jalapa. Robbins 5498 (VT).  
Jinotega, Jinotega. Moore 2110 (VT).  
La Bastilla. Zelaya 2146 (BM, ENAG, F, GH, MO, NY, SEYM, SMU, UC, WDP, WIS).  
Boaco, Boaco. Dudey 1439 (BM, ENAG, F, GH, MO, NY, SEYM, SMU, UC); Moore 1460 (WIS); Nichols 1475 (F, GH, MO, SEYM); Seymour 3865 (VT).  
Camoapa. Atwood 3517 (VT).  
Teustepe. Atwood 2422 (VT).  
Chontales, Acoyapa. Dudey 1671 (NY, SEYM).  
Apompua. Atwood 2684 (BM, ENAG, F, GH, MICH, MO, NY, SEYM, SMU, UC, WDP, WIS);  
Seymour 2693 (WIS).  
Juigalpa. Hamblett 1616 (ENAG, MO, NY, UC,

- WDP); Moore 1629 (BM, ENAG, F, GH, SEYM, SMU); Nichols 1641 (VT).  
 Rio San Juan, Castillo. Atwood 5182 (VT).  
 Chinandega, Aserradores Is. Baker 104, 2127 (GH).  
 El Viejo. Narvaez 2651 (BM, ENAG, F, GH, MO, NY, SEYM, SMU, UC, WDP).  
 Masaya, Lake Masaya. Nichols 141 (SEYM).  
 Granada, Mombacho. Grant 772 (GH).  
 Rivas, Amayo. Astacio (ENAG).  
 La Virgen. Zelaya 1244 (BM, ENAG, F, GH, MO, NY, SEYM, SMU, UC, WDP).  
 Penas Blancas. Atwood 1814 (VT); Moore 1832 (BM, ENAG, GH, SEYM, SMU).
24. Hyptis vilis Kunth & Bouche, Ind. Sem. Hort. Berol. 13. 1848.  
 Nicaragua, Costa Rica, Venezuela, Fl. C. R. 1022. 1938.
25. Hyptis conferta Pohl ex Bth., Labiat. Gen. & Sp. 112. 1833.  
Hyptis conferta Pohl ex Bth. var. angustifolia Bth. in DC. Prodr. 12:112. 1848.  
 Narrow-leaved plants have been identified as var. angustifolia but there are so many intermediates that it is difficult to draw a line between it and var. conferta.  
 British Honduras, Guatemala, Honduras, Nicaragua, Costa Rica, Panama, S. A.  
 Nicaragua:  
 Zelaya, Comarca del Cabo, Bihmona. Seymour 5740 (ENAG, MO, SEYM).  
 Bilwaskarma. Nelson 4640 (GH, MO, SEYM), 4768 (SEYM, SMU); Seymour 4714 (BM, ENAG).  
 Macantaca Creek. Allen 6495 (GH).  
 Waspan. Atwood 3641 (VT), 3642 (SEYM, SMU); Seymour 3696 (MO, SEYM).  
 Limbaika. Nelson 4912 (VT).  
 Puerto Cabezas. Atwood 4450 (GH, MO, SEYM).  
 Tamla. Seymour 6025 (VT).
- Chontales, Acoyapa. Narvaez 1718 (BM, ENAG, F, GH, MO, NY, SEYM, SMU, UC, WDP).
26. Hyptis savanarum Briquet, Ann. Conserv. Jard. Bot. Geneve 2:216. 1898. In Fl. Guatemala, this species is treated as a synonym of Hyptis conferta; but in Fl. Panama it is treated as a distinct species. Salvador to Panama, Fl. C. R. 1020. 1938.

## EXCLUDED SPECIES:

Hyptis sidaefolia (L'Heritier) Briquet, Ann. Conserv. Jard. Bot. Geneve 2:204. 1898. Reported in Fl. C. R. 1020. 1938 from Guatemala to Venezuela and Peru, but as probably not in Costa Rica. Fl. Guatemala 9:258. 1973 states that it is a South American species and that specimens from Central America so identified are probably Hyptis urticoides HBK. which closely resembles it.

18. MARSYPIANTHES Martius

Herbs. Leaves small, dentate. Flowers in axillary clusters on peduncles. Calyx 5-toothed, teeth equal, 10-nerved. Corolla 2-lipped, tube straight, upper lip 2-lobed, lower 3-lobed. Stamens 4. Nutlets hemispheric, edges fringed.

This genus differs from Hyptis principally in having boat-shaped nutlets with fringed edges. Marsypianthes resembles Hyptis and differs from Stachys and Lepechinia in having middle lobe of lower lip of corolla saccate.

1. Marsypianthes chamaedrys (Vahl) Kuntze, Rev. Gen. 524.

1891. Branches sprawling, 15-50 cm long, densely viscid villous. Calyx-teeth sharp-pointed. Corolla about equalling calyx. Illustr., Fl. Panama 56:98. 1969.

Mexico, British Honduras to Salvador and Panama, W. I., S. A. Honduras (FLAS).

Nicaragua:

Zelaya, Comarca del Cabo, Puente Pozo Azul. Seymour 4601 (SEYM); Seymour & Robbins 5821 (BM, ENAG, FLAS, GH, MO, NY, SEYM, SMU, UC).

Nueva Segovia, Plan Grande. Seymour 5148 (ENAG, MO, SEYM, SMU).

Managua, Managua. Garnier A1383 (GH).

19. COLEUS Loureiro

Herbs or shrubs. Leaves toothed, on petioles. Flowers in terminal spike-like racemes. Calyx 5-toothed. Corolla 2-lipped, mostly blue or lilac. Stamens 4. Nutlets ovoid or suborbicular, smooth.

- A. Flowers on pedicels; pedicels 1.5-2.5 mm long; blades dentate or incised . . . . . 1. Coleus blumei Bth.  
 A. Flowers almost sessile; blades crenate, pilose-tomentose beneath . . . . . 2. Coleus aromaticus Bth.

1. Coleus blumei Bth., Labiat. 56. 1832.

Herb. Peduncles short. Leaves ovate.

Florida (FLAS), Guatemala, Costa Rica, Puerto Rico (FLAS).

Jamaica (FLAS), East Indies; native of tropical Asia.

Nicaragua:

Zelaya, Nueva Guinea. Atwood & Nelson 5366 (BM, ENAG, FLAS, GH, MO, NY, SEYM, SMU, UC).

Jinotega, Bocaycito. Atwood, Marshall & Neill 6917 (FLAS, GH, MO, SEYM, SMU).

2. Coleus aromaticus Bth., Wall. Pl. As. Rar. ii: 16.

Coleus amboinicus Loureiro, Fl. Cochinch. ii: 372.

Reported in Costa Rica, Fl. C. R. 1015, 1938.

20. OCIMUM Linnaeus Basil

Herbs or slightly woody. Leaves usually on long petioles. Inflorescence of terminal racemes or panicles. Flowers in clusters. Calyx 2-lipped, margins of upper lip decurrent on tube, lower lip 4-toothed. Corolla 2-lipped. Stamens 4, declined. Nutlets obovate or spherical, rough or smooth.

A. Calyx in fruit 7-9 mm long, decurrent margins of upper calyx-lip extending to base . . . 1. Ocimum micranthum Willd.

A. Calyx in fruit less than 6 mm long or 5-7 mm long B.

B. Stems pilose . . . . . 2. Ocimum americanum L.

B. Stem glabrous below or puberulent and softly hairy on young stems C.

C. Pedicels almost obsolete; calyx in fruit 5 mm long; corolla 2.5 mm long; fruiting calyx long-ciliate, reflexed . . . . . 4. Ocimum basilicum L.

C. Pedicels 1-2 mm long; calyx 3-4 mm long; corolla 4-5 mm long . . . . . 3. Ocimum gratissimum L.

1. Ocimum micranthum Willd., Enum. Pl. 630. 1809.

Illustr., Fl. Panama 56:104. 1969.

Florida (FLAS), British Virgin Is. (FLAS), Jamaica (FLAS), Puerto Rico (FLAS). Mexico, British Honduras to Salvador and Panama, W. I., S. A., Fl. Guatemala 9:269. 1973.

Nicaragua:

Zelaya, Comarca del Cabo, Bihmona. Seymour 5741 (MO, SEYM).

Nueva Guinea. Seymour 5391 (VT).

Nueva Segovia, Ocotol. Seymour 864 (MO, SEYM).

Esteli, Condega. Mark 6332 (BM, DUKE, F, FLAS, GH, MICH, MO, MSC, NY, REED, SEYM, SMU, UC).

Matagalpa, Calabazas. Seymour 2597 (VT).

Carazo, Santa Teresa. Nichols 1316 (BM, SEYM, SMU).

Rio San Juan, San Bartolo. Seymour 6190 (VT).

2. Ocimum americanum L., Amoen. Acad. 4: 276. 1759.

Matagalpa, Tuma. Seymour 4052 (SEYM).

3. Ocimum gratissimum L., Sp. Pl. 1197. 1753.

Florida (FLAS), tropics of America and Africa, Ceylon,



Java, East Indies.

4. Ocimum basilicum L., Mant. i:35. 1767.

Cultivated in tropical America; native in tropical Asia.

## 21. CATOPHERIA Bentham

. Herbs or shrubs. Leaves dentate. Petioles long. Flowers in very dense spike, sessile, reflexed. Peduncle long. Bracts shorter than calyx. Calyx 2-lipped, one lip ovate, the other entire or 4-toothed. Corolla 2-lipped, one lip narrow, entire, the the other wide, 4-toothed. Stamens 4, much exerted. Nutlets subspherical, smooth.

A. Blades up to 5 cm wide, attenuate at base; calyx 12 mm long; corolla 2.5 cm long . . . . . 1. Catopheria capitata Hemsley

A. Blades 7-11 cm wide, rounded or subcordate at base; calyx 7 mm long at flowering time, much longer in fruit . . . . .  
 . . . . . 2. Catopheria chiapensis Bth.

1. Catopheria capitata Bth. ex Hemsley, Biol. Cent. Amer. Bot. 2:541. 1882. British Honduras.

2. Catopheria chiapensis Gray ex Bth. in Hook. Icon. 13:14. 1877. Illustr., Fl. Guatemala 9:240. 1973.

Mexico, Guatemala, Salvador, Honduras, Fl. Guatemala 9: 239. 1973.

## ABBREVIATIONS

Bth., Bentham

C. & S., Chamisso & Schlechtendal

Illustr., illustration or illustrated

R. & S., Roemer & Schultes

S. A., South America

SEYM, Herbarium of Frank C. Seymour

UCA, Herbarium of Universidad Centroamericana, Managua, Nicaragua

WDP, Herbarium of St. Norbert College, West De Pere, Wis.

W. I., West Indies

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